COAL AGE

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The technically educated mine manager is much in evidence these days. We hasten to add—this is as it should be, in fact, when we consider the extent and possibilities of mechanical equipment, as applied to mining at the present time, it is hard to believe that it could be otherwise.

We are far from agreeing, however, with the official who insists that he desires an entire organization of superintendents and foremen who can boast an engineering education. The viewpoint of the man with a technical training is so radically different to that of the so called practical man, that unless an organization contains able men of both classes, errors of judgment are sure to develop sooner or later—generally sooner.

We gave an illustration of this in our "Foreword" of Sept. 6, in discussing the possibilities of getting clean coal: The mechanical expert, with his picking belts and washeries, was compared with the practical man, who knows absolutely the kind of coal his miners *ought* to load.

The ventilation problem often brings out noticeably the two viewpoints:

If a mine inspector unexpectedly demands that the quantity of air in a certain mine be generously increased, the engineer of technical training will immediately tabulate water-gage readings, investigate fan efficiencies and live for days with fan catalogs. In contrast to him, the practical man will don his overalls and start on a personal inspection of all air courses in the mine. When you recall that the fan engineer requires eight times the power to get twice the volume, if he makes no change in his air-course areas, while the fellow with the overalls can often get double the volume with the same power, providing he can discover that his air-course area is obstructed unnecessarily. You must admit, therefore, that the overalls are about as important as the slide rule, to say the least.

Many a mine has been taxed with a new fan installation that would not have been required had an intelligent examination of airways been conducted by a competent man, with authority to carry out his recommendations.

One more example: A mine is to be greatly enlarged, and as the mine cars that have been in use are pretty well worn out, besides being of obsolete design, it is decided to purchase new cars throughout. (You'll find mines in this transition stage near at hand, if you investigate.)

The technical engineer compares prices of steel cars, as against wood, investigates the average life of each and then makes a decision. The practical man interviews the miners to see just how well the wood car, about to be discarded, suits his requirements. Is it so heavy that it can not be pushed in and out of rooms without exhausting the miner, before a fair tonnage is loaded; is it too high, requiring unnecessary effort in loading; is its wheel base too long, or too short? If too long it is difficult to put on the track when derailed, if too short it will jump the track too easily.

We know of a case where steel mine cars were purchased for a low-seam coal mine, upon the recommendation of a competent mining engineer. The cars were so heavy that the men could not handle them to advantage in and out of their rooms and the mine became so unpopular with miners that the cars eventually were replaced with wooden ones.

College men, as a rule, are clannish, when it comes to choosing between college men and practical men, just as the practical fellows are clannish, when choosing between men of their ranks, as against those with a college training; this, no doubt, explains that "birds-of-a-feather" tendency, in so many coal mine organizations.

The Madison Coal Corporation Mine No. 9

By James Taylor*

SYNOPSIS—Brief description of the surface plant and underground arrangements. The checking system, to show the number of miners and other employees in the mine, and to avoid accident by a miner going unwarned into a place where danger exists. Fire rules in force.

The property known as Mine No. 9, of the Madison Coal Corporation, St. Louis, Mo., is located at Dewmaine, Williamson County, Illinois, and embraces 1560 acres of coal and surface. The seam of coal is that known as the Williamson County coal No. 6. This seam varies in thickness from 7.5 to 9.2 ft., and is found at different depths up to 276 ft. below the surface.

The Surface Plant

The plant of this company, two illustrations of which adorn the front cover of our next issue, is one of the most complete in the state, having a maximum capacity of 3500 tons, for an 8-hour day.

The office contains a large concrete vault, for preserving maps and documents of value, and two large bedrooms furnished with five single beds for the accommodation of the mine officials or entertainment of visitors.

The hoisting engines are equipped with automatic engine stops to prevent overwinding, and the cages are fitted with a signal device so arranged that the men on the cage can signal the engineer, at any point of the trip, to stop, raise or lower the cage, as desired. The plant is equipped with an electric concrete-mixing machine, adapted to either underground or surface use. Figs. 1 and 2 are views of the interior of the machine and blacksmith shops, respectively.

The machine shop (Fig. 1) is 38x27 ft., inside measurement, built of brick and concrete. It is equipped with an electric motor, for power purposes; a steam engine to be used when the generators are out of service; a 26x28-in. by 12-ft. planer; a 26-in. lathe; a 13-in. by 6-ft. lathe; a power hacksaw; and a 27-in. swing-drill press. There are, besides, a complete set of tools for winding armatures and a complete set of machinist's tools.

The blacksmith shop (Fig. 2) is a building 38x21 ft., inside measurement, of brick construction, and is equipped with two forges; a shaper for pit-car iron; a power hammer for sharpening machine bits; a swage block; a power grindstone; an emery wheel; a power saw for cutting wood at any angle; a portable electric drill, for both wood and iron; and a crab for handling cars. There is, besides, a complete set of tools of every description, required for repairing and building cars, as well as for repairing and building dwellings.

System of Mining and Underground Construction

The system of mining is that known as the "panel system." The mine workings are laid out in panels 600 ft. square. The main and stub entries are driven 12 ft. wide and 25-ft. pillars are left between the entries of each pair. Rooms are turned off the stub entries on 40-ft. centers, at right angles to the road, and driven a distance of 250 ft.; these rooms are 20 ft. wide, with 20-ft. pillars between them.

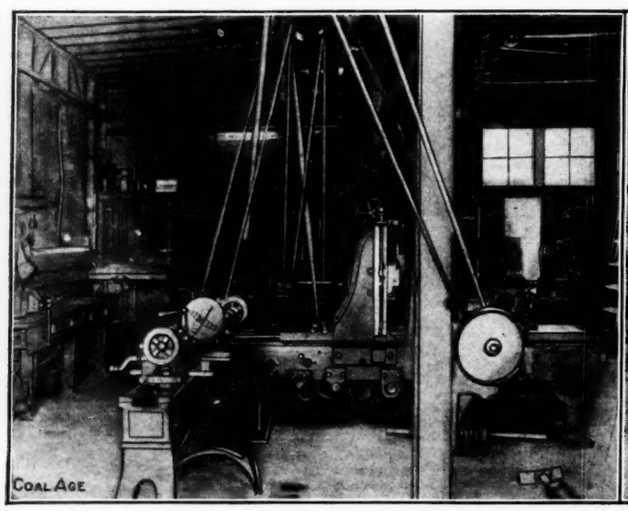

Fig. 1. Showing Interior of Machine Shop

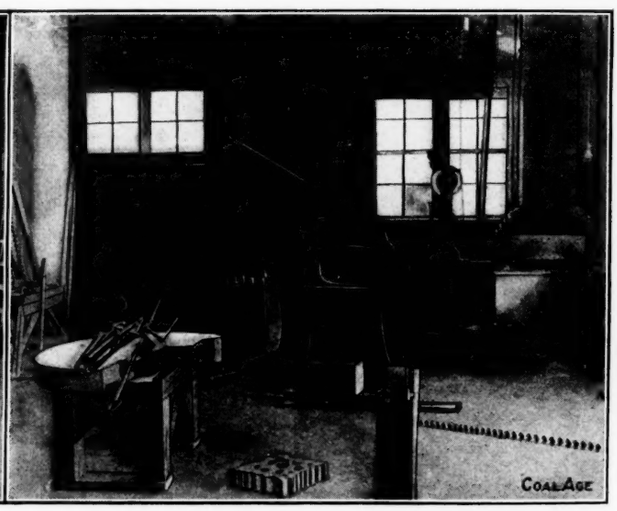

Fig. 2. Showing Interior of Blacksmith Shop

The sides of the main entry, at the shaft bottom and in the runway or cutoff for the entries, are protected with concrete walls on which are placed steel I-beams, to support the roof over the tracks. Fig. 3 shows these concrete walls and the I-beams in position. This construction is used for a distance of 1800 ft. on the main entry. The automatic trap doors used in this mine are provided with side entrances or doors, for the use of men only.

The mining law of Illinois provides that all crosscuts, connecting inlet and outlet air courses, except the last one nearest the face, shall be closed with substantial stoppings, to be made as nearly air-tight as possible. In the making of the air-tight partitions or stoppings, no loose material or refuse shall be used.

Fig. 4 shows a crosscut closed with "Pyrobar" blocks

*State mine inspector, Fourth district, Peoria, Ill.

3x10x16 in. The floor in the crosscut in which the stopping is to be erected is first leveled off, and the rib coal cut away to a depth of 6 in. and the full width of the block. A concrete foundation is then made 12 in. wide by 14 in. high, on which the blocks are placed. The blocks are laid in a good portland cement, and the work finally sealed so as to be air-tight. These blocks have proved the best stopping material ever used where it is dry.

The mining law of Illinois requires that the mine manager (mine foreman) shall provide a suitable checking system whereby the entrance into and departure from the mine of each employee shall be correctly recorded for reference. In compliance with this requirement, the Madison Coal Corporation have adopted the following system: Two duplicate check boards are provided, one being placed at the top and the other at the bottom of the main hoisting shaft.

One of these check boards is shown in Fig. 5. It is made in the form of a cabinet, having two folding doors, which when thrown open expose the checks to view, as shown in the figure. The entire board is subdivided, according to the different classes of employees. The miners' checks occupy the center of the board. The spaces are numbered in consecutive order and each is provided with a hook on which the corresponding check is hung. The check is a brass tag with a hole in it and numbered, as shown in the center of the figure. There is, also, a special tag designed to be used to notify the miner of any danger in his place. On the face of the tag is the date, check number and acknowledgment of the man that he is informed of the danger existing in his place. On the reverse side, the existing danger is explained by the mine examiner (fireboss).

When going on shift in the morning, the men receive their checks from the board at the top of the shaft, present them to the cager, who then permits them to go on the cage. At the bottom of the shaft, the miner hangs his check in its proper place on the board there provided and proceeds to his work. On leaving the mine, each man takes his check from the board at the shaft bottom, presents it to the cager, who permits him to go on the cage. Arriving at the top of the shaft, the miner returns his check to the board on the surface and goes home.

Should it happen that the mine examiner find a dangerous place, on his inspection of the mine, he removes the corresponding check from the board at the surface and hangs in its place the tag previously mentioned, on which he has written a brief description of the nature of the danger existing in that place. The checks removed by the examiner are given to the mine manager and, before the man can enter the mine, he must go to the mine manager for his check. His tag is then examined and, if he is unable to read, the nature of the danger existing in his working place is explained to him, after which the man is given his check and allowed to go below; and the tags are filed for reference.

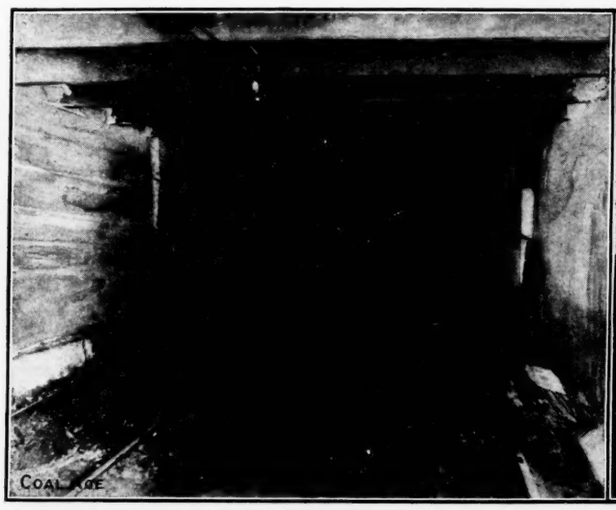

FIG. 3. SHOWING CONCRETE AND STEEL UNDERGROUND MAIN-ENTRY CONSTRUCTION

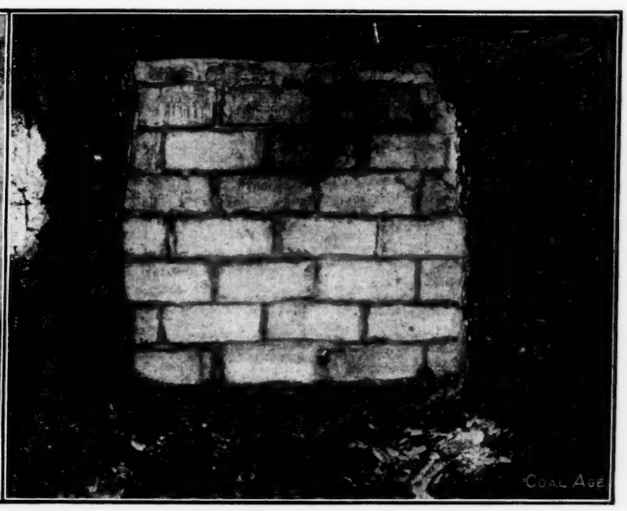

FIG. 4. SHOWING A "PYROBAR" PERMANENT FIREPROOF ENTRY STOPPING

FIRE RULES OF THE MADISON COAL CORPORATION

The Mining Law of Illinois requires fire-fighting equipment and other means for the prevention and control of fires and to avoid the loss of life from this cause, in coal mines.

1. All fire equipment shall be tested in actual drill "not less than once every fourteen days," both on the surface, as well as in the mine workings.

2. The alarm of fire on the surface shall be short, continuous blasts of the steam whistle.

3. When fire is discovered underground it must be immediately made known by telephone to the cagers at the bottom of the shaft, and by them to the mine manager and his assistants, who will immediately give such telephone instructions as will best protect the men in making their escape. Whoever first gives the alarm of fire by telephone must stay at the telephone to receive and convey such instructions as are required and in addition must notify all drivers to go into their respective territories and warn all who are working there.

4. Telephones must be kept at each "parting" and in good working order.

5. The head cager must test the telephone every two hours during each working shift, making the first test before hoisting commences in the morning. The mine manager in charge of the night shift must make frequent tests and know that the telephones are in working condition in districts where men are employed.

7. The mine managers are charged with the duty of testing the telephones and making report of their condition each day.

8. After the alarm has been given either on the surface

or below ground, no coal except that on the ascending cage must be hoisted, and both cages must be immediately relieved of cars.

9. All men upon hearing the alarm of fire must immediately go to their respective stations and prepare the pumps, hydrants, hose and chemical extinguishers for action. Drivers, motormen, trip-riders and others must immediately give notice to all employed in their respective districts and exert their best efforts to aid in the safe escape of the entire force.

10. Hoisting engineers must remain in the engine room and obey regular signals and the orders of the district superintendent or mine manager.

11. The firemen must remain at the boilers unless otherwise directed by the district superintendent or mine manager.

12. The head dumper or weigh boss, as may be directed, shall have charge of the gates and guard the shaft at the surface landing, and attend mine signals.

13. The head bottom cager will retain charge of the cages and attend to fire alarm and other signals at the shaft bottom.

14. The machinist's duty will be to attend the fire pumps only.

15. It shall be the duty of the head blacksmith or his helper (as may be designated) to open valves for conveying

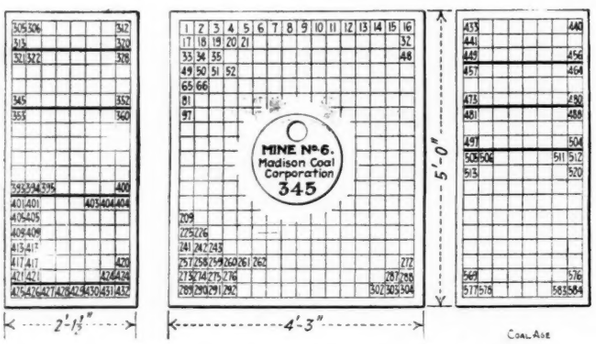

FIG. 5. SHOWING THE CHECK BOARD OPEN

water to the fan house and all water pipes on the surface and in the mines.

16. Certain assigned duties shall be given to a sufficient number of men to take charge of valves connected with all underground fire pipe lines, handle the hose on the surface and in the working buildings, as well as in the mine.

17. Under no circumstances must hay or straw be permitted to be loaded into the mine until all miners of the day shift are on the surface, and then must only be lowered into the mine after it has been inspected by the hoisting engineer or top foreman to see that the hay and straw are in bales and contained in a closed forage box with lid securely fastened to make it impossible of ignition from any cause, and the hoisting engineer on duty at the time is charged with the knowledge of such inspection.

18. The first duty of the night watchman or such other person as may be designated by the district superintendent or mine manager (when the weather permits) shall be to unreel two lines of hose (one on each side of the mine) and open the hydrant valves.

19. On the discovery of fire at night, the steam whistle must be blown and alarm also given as provided in rules 2 and 3.

The night forces must, upon the alarm of fire, go to their regular stations and duties assigned by the district superintendent or mine manager.

The greatest degree of protection and safety to life and property can only be secured by the cool, prompt action of those in charge of the forces and the fire apparatus; as well as calmness and good order on the part of all employees leaving the mine. Fire apparatus must not be handled by anyone except those authorized to do so, and then only in case of fire or for the purpose of drill and repairing.

Any person known to mutilate or damage any part of the fire machinery and appliances will be prosecuted, and if an employee, in addition thereto, will be discharged.

Among the numerous improvements the Madison Coal Corporation has installed at No. 9 mine is a Jeffrey 14x5-ft. double-inlet, reversible, underthrow fan. This fan is installed in an absolutely fireproof building of brick, concrete and steel, and has a capacity of 200,000 cu.ft. of air per minute, at a speed of 150 r.p.m., against a 4-in. water gage. This fan is driven by two Skinner high-speed automatic 19x20-in. direct-connected engines. With both engines running, it will be capable of delivering 250,000 cu.ft. of air per minute, against a 6-in. water-gage.

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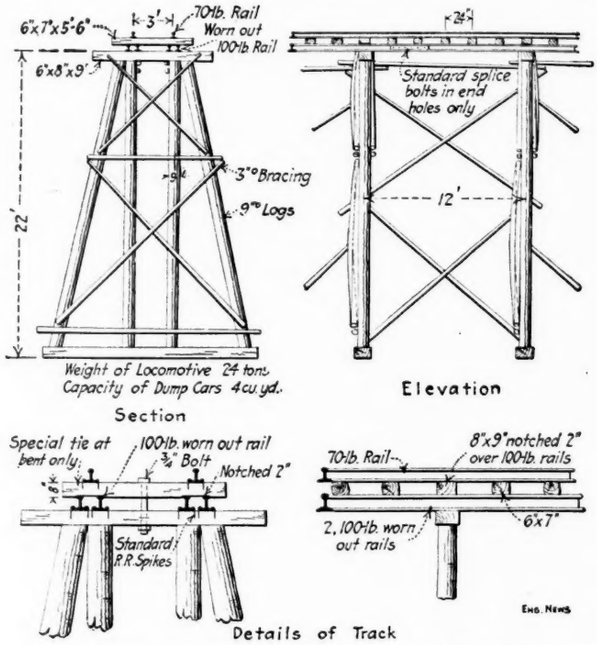
Trestles with Old Rails for Stringers

In the reconstruction of the line of the Pennsylvania R.R. at Rahway, N. J., the Keystone State Construction Co. has a considerable length of timber trestle in which the stringers are made of old rails discarded by the railway. These trestles are of two types, one used as a construction railway and the other as a filling trestle which is covered by the fill as it progresses.

The construction-railway trestle is the heavier of the two (Fig. 1). It is made up of the usual framed bents



CONSTRUCTION TRESTLE WITH RAIL STRINGERS

(Pennsylvania R.R. track elevation, Rahway, N. J., The Keystone State Construction Co.)

with round log uprights and sapling braces and a squared 6x8-in. cap. On this cap run the stringers, four old 100-lb. rails, in groups of two, spanning the 12-ft. opening between bents. These rails are spiked with standard railway spikes to the cap, and are spliced wherever the breaks come with the standard rail splices with bolts only in the end holes.

The 3-ft. gage construction track is built of old 70-lb. rails spiked to 6x7-in. ties with an 8x9-in. tie dapped 2 in. over the stringer rails at the bents. These latter ties are bolted with ¾-in. bolts to the bent caps, and this is the only fastening of the track to the bents or stringers.—*Engineering News.*

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Relation of Big Business to Mining

COAL AGE next week will contain an address on this subject, delivered by Charles Richard Van Hise, to the annual convention of the American Mining Congress held in Philadelphia last week.

Administration of Public Mining Lands

By J. F. Shafroth*

SYNOPSIS—Coal lands are not now to be obtained in the West as they were formerly acquired in the Central States. They are either held at an unreasonable price per acre or withheld from entry entirely. They are not selling and the Western States are unable to tax them for revenue. It is proposed that a royalty by some evaluated at 37 billion dollars shall be ultimately paid by the operators of Colorado to the national government, the lands meanwhile being exempt from taxation.

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It was Daniel Webster who eternally damned the Rocky Mountain region, the greatest mineral-producing area of our country. In consigning this great empire of states to the limbo of outer darkness he used the following language:

> What do we want of that vast, worthless area, that region of savages and wild beasts, of deserts, of shifting sands and whirling winds, of dust, of cactus and prairie dogs? To what cause could we ever hope to put those great deserts and those endless mountain ranges, impenetrable and covered to their very base with eternal snow? What can we ever do with the western coast, a coast of 3000 miles, rock-bound, cheerless and uninviting?

The American pioneer, braving every danger, overcoming every hardship, meeting with fortitude and courage the difficulties and perils of the wilderness has returned sufficient answer to the doubts of the New England statesman. Where lay the barren desert now thrives a fruitful land of promise. But the spirit that prompted the harsh dictum of Webster is still alive in activities of later statesmen. Where he lacked imagination and vision they refuse to accept the evidence of their own senses. And so they have added to the pioneer's burden, discouraging rules and regulations which seek to deny to him the fruits of his toil.

Western Mining Conditions Once Favorable

The government recognized that it was the explorers, settlers and developers who made the value of everything in a wild and uninhabitated country; that if the lands were not exploited and improved they would remain as worthless as they had been for 6000 years.

Under this general policy of rewarding the pioneer citizens of the United States in the development of the natural resources of the public domain, thousands of people crossed the trackless desert for California, and there discovered the richest gold fields ever known in the history of the world. These gold mines were upon the public domain. There was no law providing for the location of mining claims. The miner locating gold fields in California could have been considered by the government a trespasser and liable to refund to the government the value of all the gold extracted; but under the policy of the government as to the settlement of lands in Ohio, Indiana, Illinois and Missouri no one ever suggested that the miner was not entitled to the fruits of his discovery; and the miners themselves proceeded to frame rules and regulations as to the manner of locating and developing the mines. These provisions were afterward enacted into laws by Congress, not to provide a profit to the national government, but for the purpose of promoting the production of the greatest wealth to the nation and benefitting all the citizens thereof.

Under that policy there has been a development of the Western country unparalleled in the history of the world. Three billions of dollars in the precious metals, produced at a cost of perhaps that amount of money, but turned into the channels of trade, have contributed largely toward making this country the most prosperous nation on earth. It is the increase of basic money that has always given a quickening impulse to business and commerce. An enormous development has been produced in all the other industries of that region.

The Lands Are Now to Be Leased

Now it is proposed, by bills introduced in Congress, and advocated by followers of Mr. Pinchot, to change this policy, to impose royalties upon powers generated by falling water, and to lease the oil and phosphate lands and the coal and metalliferous mines upon a rental basis payable to the treasury of the United States.

No other states have had their resources taxed by the national government, and we deem it is unfair that the people of the states which had all the products of their natural resources for themselves should now require, through their senators and representatives, these less favored states in the West not only to undertake the development of the natural resources of these states, but to pay into the federal treasury a tax upon the very development thereof.

Exemption from Taxation

What does the leasing of the natural resources of the mountain states mean? It means perpetual ownership in the national government, and that means exemption from taxation forever. Perpetual exemption from taxation of vast territory in a state is almost destructive of its development. It is an injustice which, it seems to me, every fair-minded person must recognize. The state must maintain government for state, county and school purposes over all the lands within its borders, whether reserved or not.

In the West the taxes upon land for a period of 30 years, including reasonable interest upon each yearly payment, amount to the value of the land. Therefore, when the lands privately owned must pay all of the taxes for state, county and school purposes it is equivalent to their paying every 30 years, in addition to their just taxes, an amount equal to the value of the public lands. Thus the people of these states must pay for these public lands every 30 years and yet never own a foot of the same. Is that right; is it just; is it the way a parent would treat a child? Is it a compliance with the enabling acts which provide that each state is "admitted into the Union upon an equal footing with the original states in all respects whatsoever."

This new policy would not only deprive the states of the means of raising the necessary revenue to establish and maintain good government, but in addition to that injustice the advocates thereof propose to make revenue

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*Senator from Colorado.

Note—Paper read before the American Mining Congress, Oct. 22.

for the federal treasury by taxing the natural resources of the West. By so doing they propose to make the mountain states pay an undue proportion of the burdens of the national government.

What a Ten-Cent Royalty Will Raise

It has been estimated by the geological survey at Washington that there are contained within the boundaries of the state of Colorado 371,000,000,000 tons of coal. More than three-fourths of this coal is upon the public domain. If a rental of 10c. per ton is to be imposed upon that natural resource of the state of Colorado, it would mean ultimately that the citizens of our state must contribute $37,000,000,000 to the federal treasury. This tax is advocated on the ground that it will prevent waste. According to the geological report, Colorado alone has sufficient coal to supply the world for 300 years, at the present rate of consumption of about one and one-quarter billion tons per annum. Although my state is now mining 11,000,000 tons of coal a year, yet our production for 50 years has exhausted only one-half of 1 per cent. of our coal deposits.

If royalties are to be paid for the extraction of the precious and base metals, other millions will be turned into the federal treasury from the natural resources of our state. It may be that it will be proposed, as is done in the forestry department at Washington, that one-fourth of the receipts will be turned over to the state treasury, to be used only for certain purposes to be prescribed by the federal government. But is it equal or fair treatment to our commonwealth for the government to impose any tax whatever upon our natural resources, which it has never imposed upon the older and richer states of the Union? It must be remembered that the act of Parliament of Great Britain imposing duties upon goods shipped to the 13 colonies, against which our forefathers rebelled, provided that the revenue derived therefrom should be expended in America for its protection and defense.

The policy of the nation holding in perpetuity great forest reserves and coal, gas, oil, phosphate and mineral lands, and rights-of-way for water-power plants, and controlling the same, is an interference with local affairs which, according to our theory of government, should belong to the states.

The State Should Control the Lands Within Its Borders

It was the late Justice John M. Harlan, of the supreme court of the United States, who said:

> A national government for national affairs and state governments for state affairs is the foundation rock upon which our institutions rest. Any serious departure from that principle would bring disaster upon the American system of free government.

The permanent administration of public lands in a state, sovereign as to all functions except those which were delegated to the national government, is an interference with local affairs never before attempted in the history of this country. Such administration by a bureau at Washington, with its thousands of guards imported from other states patrolling these gigantic areas, can never be satisfactory to the people of the states in which such lands are situated. The bureau will always be controlled by officers who are not in sympathy with the people of such states. Carpetbag government of such local affairs is bound to follow with its antagonism to everything that interferes with the national government's control and use of these reserves, which we think are so destructive of the development of our states.

The discouragement to the prospector of mineral lands, by reason of the rules adopted by the forestry bureau, has been so great in Colorado that there are now practically no prospectors left. And yet we know that the hills of our state have hardly been scratched in prospecting for the minerals therein contained. It is impossible for these reserves to be managed to the best interests of our people by a bureau administered two or three thousand miles away.

How Congress Impoverishes the Nation

The effects of this bureaucratic administration of our mineral lands are evidenced in great distress not only to the states directly concerned but also to the commerce and industry of the entire nation. The prospector has been driven from the hills. Under the rules and regulations promulgated by absentee guardians of our estate he has become a trespasser upon the lands of his commonwealth. He dare not go into the hills to scratch for precious metals lest some ranger lately imported from Connecticut or New Jersey warn him off.

Against the physical obstacles which nature placed in his path the pioneer prospector pitted a stout heart and a willing hand, and came victorious from the encounter. But the artficial barriers raised up by the government of the United States have proved too strong for him and he has succumbed in the unequal struggle. His state is poorer by his passing, and industry and commerce move in sluggish channels with the cutting off of his contributions to them.

Appointment of Mine Inspectors in West Virginia

Following is a list of district mine inspectors appointed by the new chief of the Department of Mines, in West Virginia, Earl A. Henry. The appointments are for a period of four years.

Name	District	Address
Karl F. Schoew	First	Fairmont
Frank E. Parsons	Second	Clarksburg
L. D. Vaughn	Third	Grafton
W. B. Plaster	Fourth	Elkins
R. B. Cobb	Fifth	Montgomery
Enoch Carver	Sixth	Charleston
James Martin	Seventh	Charleston
E. J. Flanagan	Eighth	Montgomery
L. B. Holliday	Ninth	Beckley
Arthur Mitchell*	Tenth	Bluefield
John Phillips	Eleventh	Welch
E. C. Lambert	Twelfth	Williamson

Mr. Henry has served the state, as district mine inspector, for a number of years, and is thoroughly familiar with the conditions of mining throughout the state. Much is to be expected, during Mr. Henry's administration, in the work of continuing the systematizing of the mine-inspection service in West Virginia. The chief of the Department of Mines has always had the hearty coöperation and confidence of the entire body of district inspectors, and to this fact is largely due the rapid advance that has been made in the state, during the incumbency of John Laing, formerly at the head of the department. We bespeak the same hearty support, during the present administration.

*Resigned; see Personals, p. 675.

The Costs and Profits in Coal Mining

By Edward W. Parker*

SYNOPSIS—An illuminating study of some of the business aspects of the coal industry. Despite the well known fact that the anthracite companies are growing stronger financially each year, Mr. Parker presents figures showing that anthracite mining yields practically no profit. The same rather incongruous condition prevails in the bituminous industry. Western operators fare the best.

In order to do justice to the subject and to the occasion, a paper on the cost of coal mining prepared for presentation before the American Congress should be based upon an intensive study of the records, not too many, of typical operations in a sufficient number of states to get results capable of analytical comparison and deduction.

Unfortunately, when I was asked by the Secretary of the Congress to prepare this paper there was not time to collect data from which such a study could be made, and I have been compelled to adopt as the basis of this discussion the latest official statistics available, those of the Thirteenth Census of the United States, which covers the calendar year 1909. Since that time wages have been advanced in both the anthracite and bituminous districts, and prices for the product have been raised to compensate for (and in some cases, possibly more than offset) the increased cost of production.

Necessity for More Careful Accounting

If at the outset I may be permitted to make a suggestion, as to one thing needed in the coal-mining industry (looking at it from the standpoint of the statistician and economist) it is a standardization in the methods of accounting. It is difficult—one might say impossible—to compile accurate statistical data regarding cost and value of product when operators themselves cannot tell what their product costs nor what they actually receive for it, and when their only means of judging whether they are making or losing money is by their bank accounts.

Within the present year the Geological Survey was requested by one corporation, whose value of production is measured by the tens of millions, to furnish statements of its output some ten or fifteen years ago, which it was unable to ascertain from its own records. The only reason that the Survey could not comply with the request was that the schedules and tabulations are kept for two years only, for purposes of comparison, and are then destroyed, as there is no place where they can be safely stored and the best method of maintaining their confidential character is to burn them.

In the anthracite region particularly is it difficult to secure accurate information, not only in regard to mining cost, but also the value at first hand of the output. A large proportion of the anthracite is sold at so much a ton delivered at Buffalo, or Chicago, or Milwaukee, or wherever it may be, and the sale price of the coal at the mines includes the freight to the point of delivery and is so entered on the books. Until the recent action of the United States Supreme Court abolishing the contracts between the anthracite companies and the transportation interests, all the anthracite shipped to New York harbor ports for a number of years has been sold on a percentage basis of the tidewater price, the railroads taking 35 per cent. for the freight and returning 65 per cent. to the operators.

The magnitude of the task of determining what the actual value of the product is, was rather forcibly brought home to me last spring, when I called at the New York office of one of the big anthracite companies for the purpose of urging the expediting of that company's report. It had furnished complete reports of production, by sizes, for its numerous mines, but had omitted any statement of values. I had written a letter urgently requesting as accurate a statement of the value as I had received of the production, and had been promised the additional information. The auditor brought for my observation sheet upon sheet of closely written figures, upon which the calculations necessary to get the data had been made. It had taken the entire time of one clerk more than two weeks to do the work.

Difficulty in Computing Costs

What goes into mining cost is in many cases as difficult to ascertain. As many here well know, the old type of wooden or corrugated-iron breakers in the anthracite regions of Pennsylvania is giving way rapidly to modern structures or reinforced concrete or other fireproof construction. I have been reliably informed that the investment in most cases is charged, not to capital account, but to mining expenses. It must, of course, eventually go into the cost of mining, but it seems to me that it is an investment, not an expense, and when charged into the cost of mining should be in the form of depreciation, and of interest on the investment.

These are cited merely as examples of the complexities which confront the economist when he undertakes to annalyze such statistics as he finds available. There is a somewhat general impression that the mining of coal, both anthracite and bituminous, is a highly lucrative vocation, and that the principal occupation of the so called coal barons is to look pleasant as the golden stream flows into their coffers. I venture to state, taking the industry as a whole, that there are few lines of industrial endeavor where, during the last ten years, there have been smaller returns for the capital invested and for the energy, mental and manual, that has been put into it, than in the business of coal mining.

As has been already observed, the only recent official statistics of relative cost and value available are those presented in a recent bulletin published by the Bureau of the Census and which cover the calendar year 1909. This report shows that the value of the Pennsylvania anthracite produced in that year was $148,957,894. The total gross expenses amounted to $139,110,444, from which should be deducted $4,864,844 made up from charges to miners for explosives, oil and blacksmithing, making the net expenses $134,245,600.

*Statistician, U. S. Geological Survey, Washington, D. C.

Note—An address before the 16th annual convention of the American Mining Congress, Philadelphia, Oct. 20 to 24, 1913.

The gross expenses are itemized as follows:

Services:		
Salaries	$4,572,489	
Wages	92,169,906	$96,742,395
Supplies:		
Fuel and power	3,189,279	
Other supplies	23,472,809	26,662,088
Royalties		7,969,785
Miscellaneous		7,736,176
Total gross expenses		$139,110,444
Deductions		4,864,844
Net expenses		$134,245,600

Earnings of the Anthracite Operators

The total production in 1909 amounted to 72,215,273 long tons, so that the average value per ton for the output in that year was $2.06; the average cost per ton was $1.86; and the net returns on the operations for the year were $14,712,294, or an average of 20c. per ton. This at first glance looks like a fair return, but attention must be called to the fact that the Census figures of cost make no allowance for interest on capital invested or borrowed, and no offsetting charges for amortization or depreciation.

According to the returns to the Bureau of the Census, the entire capital invested in anthracite mining in 1909 was $246,700,000, which may appear rather inadequate when one considers the magnitude of the industry, and an annual production of $150,000,000 (in 1911 the output was valued at $175,189,392 and in 1912 it was $177,622,626), but I am taking the figures reported by the Census Bureau. If on this capitalization an allowance of 4 per cent. be made for interest, the net returns for the year amounted in round numbers to $4,844,000.

If, as I suggested at the outset, new breakers and other equipment are charged into operating expenses no allowance need be made for depreciation, but surely the exhaustion of from 75,000,000 to 80,000,000 tons from the reserves every year should have some amortization charged against it and if 5 cents a ton be allowed the margin of $4,800,000 is practically wiped out. At least it may be said that from the operators' standpoint there may have been some reason for the recent advances in the price of anthracite, the effect of which the author of this paper has felt as keenly as any other consumer of anthracite.

The figures covering the cost and value of bituminous coal show even more striking comparisons. I may remark here that there are some slight differences in the statistics of production between the Census figures and those published by the United States Geological Survey for the reason that the Census investigations excluded mines having a production of less than 1000 tons, whereas the Survey rakes the country with a fine-tooth comb and includes every small country bank, from which it can secure a report. For 1909 the Survey showed a bituminous coal production of 379,744,257 short tons valued at $405,486,777, and the Census Bureau showed a production of 376,865,510 tons valued at $401,577,477, the difference being about 3,000,000 tons in quantity and $4,000,000 in value—less than 1 per cent. in either case. As the Census figures for cost of mining are the basis of this discussion, the Census figures of production are also used.

Profits in the Bituminous Industry

The total value of the bituminous production, as already stated, was $401,577,477, and the mining expense of producing this value, including salaries of officers, was $378,159,282. As in the case of anthracite, the expenses of production do not include any charges for depreciation, amortization, or interest on capital invested or borrowed. The expenses are divided as follows:

Salaries	$20,417,392
Wages	282,378,886
Supplies	45,345,932
Royalties	12,035,900
Miscellaneous	17,961,172
Total	$378,159,282

From this it appears that 75 per cent. of the total cost and 70 per cent. of the total value was spent in wages. Salaried officials got less than 5.5 per cent.

Now, let us see what capital got. The total capital invested in the bituminous coal mines of the United States in 1909 was, according to the Census bulletin, in round numbers $960,000,000 ($960,289,465), and I do not think that looks as if there were very much over-valuation, whatever the capitalization may be as represented by stock issue. The difference between the value of the product and the expense of producing it was $23,440,000 in round numbers or a fraction over 2.5 per cent. on the capital.

The average value per ton of all the bituminous coal produced in the United States was $1.07 and the costs averaged a fraction of a cent over $1, so that the margin of profit to cover interest, depreciation and amortization was a little less than 7c. a ton. In some states the expenses exceeded the returns. Take Arkansas, for instance, where the expenses totaled $3,630,526 and the value of the product was $3,508,590. Other instances were:

	Value of Product	Expenses
Iowa	$12,682,106	$12,816,076
Kentucky	9,940,485	10,127,987
Tennessee	6,548,515	6,691,482
Oklahoma	6,185,078	6,536,441
Virginia	4,336,185	4,392,440

Conditions in the Leading States

Pennsylvania, by long odds the most important producer, wth an output of 137,300,000 tons, showed a total of expenses of $117,440,000 and of value of $129,550,000, a balance on the profit side of a little over $12,000,000, or about 3¼ per cent. on the capital invested, $358,600,000. The four competitive states, West Virginia, Illinois, Ohio and Indiana, which rank second, third, fourth and fifth, respectively, in producing importance, all show such narrow margins between income and outlay that profits are visible only with a microscope. The figures follow:

	Value of Product	Expenses	Difference
West Virginia	$44,344,067	$43,024,716	$1,319,351
Illinois	53,030,545	51,697,504	1,333,041
Ohio	27,353,663	27,153,497	200,166
Indiana	15,018,123	14,906,831	111,292
	$139,746,398	$136,782,548	$2,963,850

These four states with an aggregate production of a little more than the bituminous output of Pennsylvania, showed a total of less than $3,000,000 as the excess of receipts over expenses. The capital invested in the coal-mining industry in these states was something over $310,000,000, so that the returns on the capital were less than 1 per cent.

More Profitable Conditions in the West

There is one other fact to which I desire to call attention, and that is to the conditions in the public-land states, which are also coal producers. They are Califor-

nia, Colorado, Idaho, Montana, New Mexico, North Dakota, Utah, Washington and Wyoming. All of them showed favorable comparisons with other states. They produced in round numbers 25,000,000 short tons of coal in 1909. The value of the product was $37,000,000; the expenses, $32,400,000, the difference being, say, $4,600,000. The capital reported was approximately $70,000,000, so that the average earnings on the capital invested in these states was between 6 and 7 per cent., as compared with less than 1 per cent. in West Virginia, Illinois, Ohio and Indiana, and of about 2.5 per cent. for all the bituminous coal mined in the United States in 1909.

I have not prepared this paper as an advocate of the coal-mine operators of the United States. I must, in fact, confess that when I began, less than three weeks ago, a study of the Census bulletin, I was somewhat surprised at the facts presented therein, though I was familiar with the general situation. If there is any other branch of the mining industry conducted on such narrow, not to say dangerous margins, I should be glad, yet sorry, to know it.

When these figures are considered one must feel that if there is any mulcting of the people in the coal industry the operators are not the robber barons. And when the dividing line between profit and loss is so faint, all the more credit is due to the men in authority who are throughout all of the coal-mining regions spending thousands of dollars to reduce the hazard and improve the conditions under which the miners work.

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The Taxation of Coal Lands

By R. V. Norris*

SYNOPSIS—Former suggested basis of valuation of coal lands for taxation purposes. Valuation on a sales basis legal but unequal. The foot-acre rule inadequate, unjust and prohibitive. Valuation on a royalty basis illegal and illogical. Valuation on estimated profits objectionable and has never been applied in Pennsylvania. Conclusions—Taxation of mineral in place logically and economically wrong. Suggested basis for assessment valuation of mineral properties.

❖

The proper method for the taxation of mineral land is, and always will be, a difficult problem. Unlike other property the value of such land is not readily ascertainable from sales and offerings, and many conditions may radically affect its true value.

The assessment of lands in the anthracite district of Pennsylvania is a good illustration of the difficulties inherent in attempting to arrive at a proper taxable value for coal lands. Up to 1907 the assessed valuations in this region, while irregular and in many cases unjust, were not so excessive as to create an unendurable burden on the industry and, therefore, were not seriously resisted. In 1907, however, a general revision of the assessed valuation was attempted and the resulting assessments were so high that they were resisted in the courts, with the result that taxes under this assessment are still in litigation, and appeals have been filed from all the later assessments, with a resulting condition of almost intolerable chaos.

The assessment of lands for taxation, in Pennsylvania, is made under acts of the legislatures of 1841 and 1842, by which the assessors are required to "assess, rate and value every subject of taxation according to the actual value thereof and at such rates and prices as the same would bring at a *bona fide* sale after due notice." In actual assessment four methods of taxation have been attempted or suggested: 1. Valuation based on actual sales. 2. Valuation based on foot-acres of coal remaining in the ground. 3. Valuation based on royalty values. 4. Valuation based on capitalized estimated profits. All of these methods have proved unequal and unsatisfactory and it is the purpose of this paper to discuss them and to point out their impracticability.

Valuation Based on Actual Sales

This method, which under various decisions of the Supreme Court of Pennsylvania is the only strictly legal one, has resulted in an almost hopeless tangle of the testimony in the tax-appeal cases. Sales have been shown from a few hundred up to over ten thousand dollars per acre, for coal land. The smaller values are usually for lands containing relatively thin coal; medium values, from two to three thousand dollars per acre, for relatively small areas with normal coal contents but unopened and not generally of sufficient area for separate operations; while excessive values, in a few cases, are for going concerns or for lands strategically located and thus having inflated values to particular purchasers.

Valuation Based on Foot-Acres of Coal

It was early apparent that the mere sale values per superficial acre, for scattered tracts, could not properly be used as a criterion of value for lands containing widely different thicknesses of coal; and in the late eighties the assessment value was based on the foot-acreage holdings of a generally average blanket thickness, arrived at by the engineers of the operating companies, who returned under oath the average thickness of workable coal remaining unmined and calculated as spread equally over the area of each tract covered by the bottom bed.

This method, while more equitable than a valuation based on superficial acreage irrespective of coal thicknesses, is unjust in that it takes no cognizance of the varying thicknesses or qualities of the different beds of coal and the radically different costs of mining the same and, further, is distinctly objected to by the Supreme Court of Pennsylvania, which says:* "The foot-acre rule for ascertaining the valuation of coal lands of the appellant, for the purpose of taxation, is not a proper measure of their value."

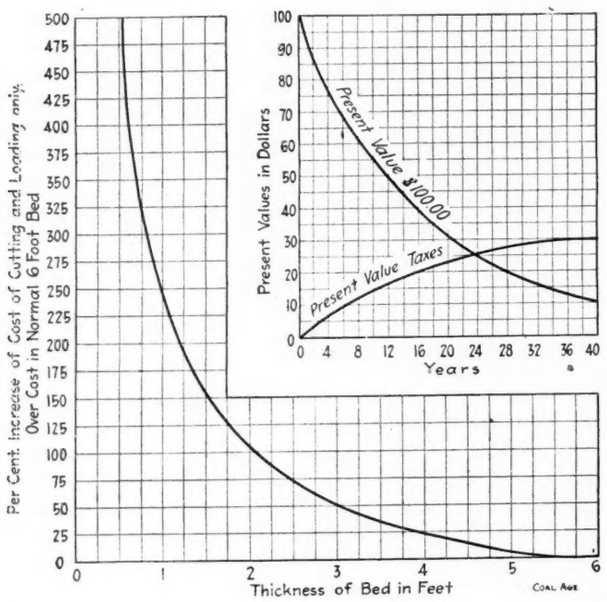
As an illustration of the extent to which the thickness and quality of coal influence its value, the following diagram is presented, which shows the increased cost, in cut-

*Address delivered at the Sixteenth Annual Convention of the American Mining Congress, Philadelphia, Penn., Oct. 20-24, 1913.

*Penn. Supreme Court Report No. 229, p. 465, Reading Appeal.

ting and loading only, due to decreased thickness, in one particular colliery. This does not, of course, begin to show the total increased cost of mining in thinner beds, with the necessary greater development, more extensive haulage and ventilation, longer transportation, additional pumping, and greater cost of preparation; but certainly does indicate the irrationality of an assessment based on coal contents alone, irrespective of conditions.

The actual assessments per foot-acre, which under various subterfuges are still persisted in, despite the law as interpreted by the Supreme Court of the state, have gradually increased from about $50, to the 1913 assessment in Luzerne County, in the Wyoming field, where the assessed valuation was actually fixed at an equivalent present rate of $250 per foot-acre, or about 20c. per ton for all coal, of all sizes, estimated to be ultimately recoverable from the lands. Assuming that the average date of mining, for all coal will be but fifty years hence,


Per Cent. Increase of Cost of Cutting and Loading only, Over Cost in Normal 6 Foot Bed
Thickness of Bed in Feet
Present Values in Dollars
Years
Present Value $100.00
Present Value Taxes
COAL AGE

DIAGRAMS SHOWING INCREASE OF COST IN THIN SEAMS; AND VALUATION OF PROPERTY AND TAXES WITH RESPECT TO LIFE OF MINE

and that taxes must be paid on this valuation at the rate of, say only 20 mills, the present value per ton of coal available in the ground on the basis of this monstrous assessment would be about $2.37, a figure many times greater than any possible value for mining purposes.

VALUATIONS BASED ON ROYALTY VALUES

This method, which has been advocated by many engineers appears at first sight eminently logical and proper. It has been objected to, however, by the Pennsylvania Supreme Court,* and hence cannot be legally used for assessment valuation. This report says, referring to royalty basis of valuation:

> Its market value is its fair selling value for cash, not payable as royalty strung out through a long series of years, but payable at the time or as soon thereafter as the value could be determined. Such a method does not make allowance in undeveloped territory for the length of time coal may lie in the ground unmined, undeveloped and unprofitable. It is impossible to reduce to a scientific basis and to mathematical precision the elements of value entering into the present selling price of a tract of coal land. The question is not what earning power coal lands may develop in the future, but what they are actually worth in the market at present.

Further, this method presents inherent difficulties and objections, which remembering that, under the Pennsylvania Law, assessment on similar properties must be equal, appears to be insuperable. On a royalty basis of valuation, the time of mining is the controlling factor in calculating values. As an example, assume five exactly similar properties, each containing 2,000,000 tons of coal, to be worked out *seriatim,* at an average of 100,000 tons per year, each paying 30c. per ton royalty, making the annual royalty payment, during the mining of each tract, $30,000. On the basis of the Luzerne County, Penn., 1913 assessment, these properties would each have an assessment value of $400,000, and would pay approximately $8000 annual taxes, up to the average time of exhaustion. Their present values, on a royalty basis, calculated at 6 per cent. would be as follows:

Tracts	Start Mining Yr.	Complete Mining Yr.	Present Value Royalties	Less Present Value Taxes	Net Present Value
First	0	20	$344,100	$58,880	$285,220
Second	20	40	107,360	110,120	12,760
Third	40	60	33,550	126,100	92,550
Fourth	60	80	10,430	131,080	120,650
Fifth	80	100	3,250	132,550	129,300

Thus, even without any taxes, the coal held for future necessities is shown to have but small present value, and including the taxes to be paid (except the first assumed tract to be mined out within twenty years) is worse than valueless and would be held by the owners at a loss. This condition may be well illustrated by the smaller diagram showing the present values, and present tax charge on $100 to be paid at a future date, as on lands held for reserve.

Hence, the Supreme Court is unquestionably justified in rejecting a royalty basis for assessment valuations; and, taking the five example tracts above, it is apparent that, depending only on the element of time, the valuations on this basis vary from a value of $285,000 to a loss of $129,300. It is greatly to the financial interest of the owners to have the properties exhausted in the shortest possible time, practically regardless of the ultimate yield. From a financial standpoint, they are fully justified in taking only the most available and most easily and quickly mined coal, even at the cost of the utter destruction of thinner beds, which may be interstratified with the thicker ones and which would be irretrieveably ruined by the removal of larger beds below them.

Further, as a commentary on the justice and equality of an assessment based on royalty values, it is evident that a mere change of ownership, transferring a tract of coal land from a reserve for fifty years or more in the future under one ownership, to coal immediately available to another would radically change its assessed value. Also, a valuation on present royalty rates may result in absolute tax confiscation of lands leased at the going rates of many years ago, in many of which leases the taxes were covenanted to be paid by the owners, as many anthracite leases made in the sixties and seventies of the last century pay from 8 to 25c. per ton on the larger sizes only, while present royalties vary from 35 to 60c. per ton for prepared sizes, with about half these prices for pea and one-quarter for buckwheat coal.

VALUATION UPON CAPITALIZED ESTIMATED PROFITS

This method of valuation has been proposed, but as far as is known has never been applied to the assessment of

*Penn. Supreme Court Report No. 299, p. 470.

coal land in Pennsylvania. It has all the objections applying to royalty valuations, with the further very serious objection that the profits of mining enterprises are, under similar conditions, largely dependent upon the management that such a basis for assessment would result in, and unjustly penalizing good management, which essentially involves good and economical mining with resulting lower losses and the recovery of larger percentages of the mineral in the ground.

Conclusions

It appears that none of the suggested or attempted methods of assessment have resulted or can result in an equitable valuation, fair and just to both the public and the owners of coal land; that even moderate taxation of the coal in the ground is opposed to all principles of conservation, as its effect is to put a tremendous premium on rapid mining almost regardless of ultimate recovery and to encourage the destruction of poorer and thinner beds interstratified with the better ones because of the enormous penalty entailed in slower mining, and because such taxation acts to discourage, by prohibitive penalties, the holding of lands in reserve for the future necessities of the people.

For these reasons, it appears that the taxation of mineral in the ground is logically and economically wrong, leading as it does to the rapid and uneconomical exhaustion of the mineral wealth of the country, and putting a premium on premature and wasteful exploitation. The proper method of taxation for all minerals appears to be *a tax based on the value at the mine of each year's product, at the local rate of taxation assessed for that particular year, including an assessment on surface lands, outside improvements and machinery, the value of which is readily ascertainable; but not including any valuation of mine openings or inside improvements, which are incidental to the mining process and which after the exhaustion of the mineral are of no value.*

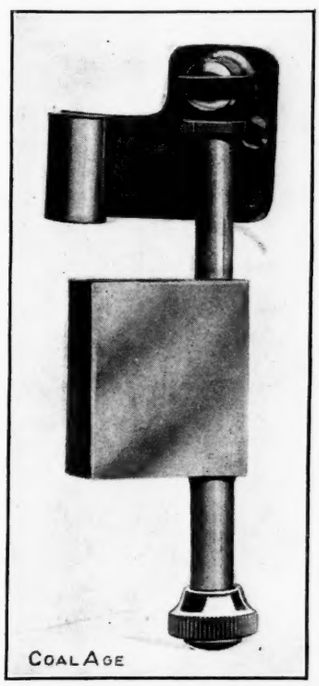
Thus, a colliery producing 1,000,000 tons of anthracite in 1912, with a value at the mine of, say $2,500,000, and with surface and improvements valued at $1,500,000, should pay taxes for the year 1913, on $4,000,000 assessed valuation, regardless of the area of coal land tributary to such a colliery; and if, for any cause, the production in some later year should fall to $1,000,000 in value and the value of the surface and improvements decrease to $1,000,000 the taxes for the following year should be assessed on a $2,000,000 valuation.

This suggested method of assessment and taxation of coal lands is, of course, clearly illegal under the present laws of the state of Pennsylvania; and its adoption would require special legislation to put it in force. Also, while not absolutely just, in that it assesses coal from thin and impure beds that are costly to mine, at the same rate as that from the more cheaply mined, thick and pure beds, the plan would, if legalized, possess the inestimable advantage of doing away with all uncertainty and litigation as to assessed valuations; result in the payment of taxes in greatest amount at the times of greatest production and consequent greatest population and public need for money; and, by concentrating taxation on the land most actively worked and relieving reserve land from its present crushing burdens, would tend to the conservation instead of the dissipation of the irreplaceable coal resources of the country, by encouraging the complete mining of lands when once opened, including all workable beds large and small, rather than encouraging the opening of the best beds, on all lands, to obtain immediate returns and avoid the burdens of accumulating taxation, even at the cost of the destruction of smaller and less valuable beds lying above the larger ones.

A Good Friction Igniter

The Vaughn-Miller safety-lamp igniter, recently placed on the market, combines some qualities that recommend it strongly to users of the Wolf or the Siple naphtha lamps. The igniter fits both of these lamps and is quickly inserted without difficulty or alteration of the lamp.

This igniter, which is shown in the accompanying figure, is the invention of L. D. Vaughn, mine inspector, third district, West Virginia. Mr. Vaughn has had 42 years' experience in mines and has made a close study of the question of safety lamps. In his igniter he has employed a carborundum cart[illegible] said to give 5000 flas[illegible] and can be replaced when worn out, at slight expense. One of the features of the igniter that insures the ready ignition of the wick of the naphtha lamp is the fact that the spark, which produces the ignition, is thrown horizontally against the wick. Another feature of this igniter is that when not in use it is lowered in the lamp, so that it will not obstruct the light. All that is necessary to relight an extinguished lamp with this igniter, is to push up the small rod that extends down through the bottom of the lamp, and twist it sharply to the right. A small spring keeps the cartridge pressed against the friction wheel of the igniter.



A Friction Igniter

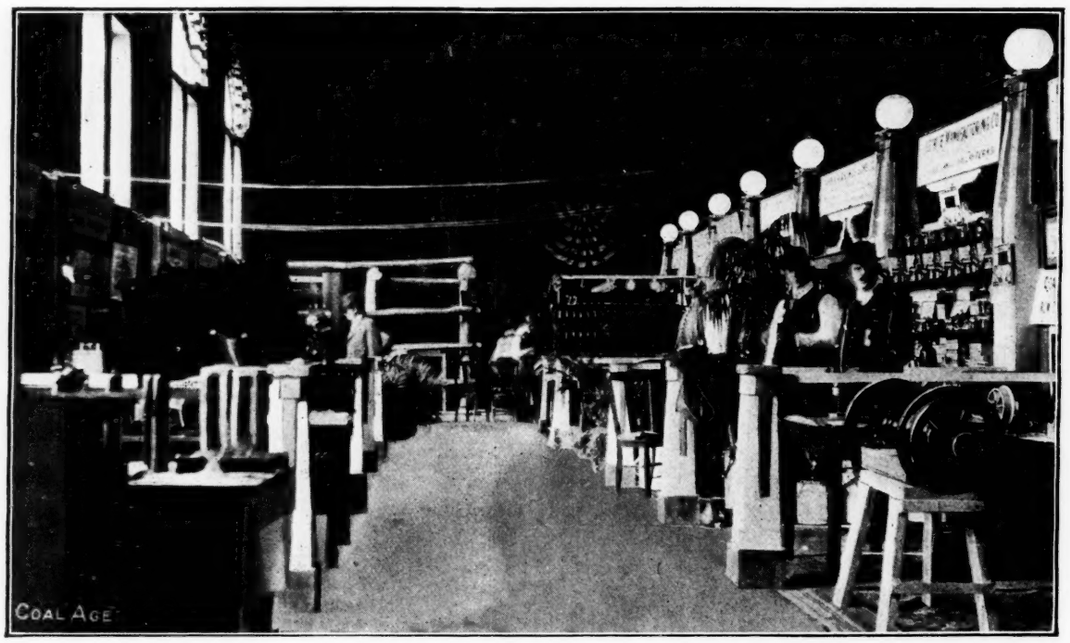
While this igniter has been on the market for several months, and has given good satisfaction, the sale has not been pushed until now, awaiting the results of tests made by the Bureau of Mines. The circular states that, on Aug. 14, this igniter was subjected to a series of rigid tests by the Bureau of Mines, at Pittsburgh, Penn. In an 8½ per cent. mixture of gas and air, in still air, 500 continuous flashes of the igniter in a safety lamp failed to ignite the gas outside of the lamp, the gas burning in the combustion chamber and filling the lamp with flame. Following this, the same tests were made in 600-ft., 1000-ft., 1500-ft. and 2500-ft. velocities of the air current, the last named being the highest velocity attainable at the testing station. In these tests of more than 500 flashes each, the lamp was continually filled with flame, which, however, did not pass the gauze, although the latter, in the last-named test, was almost at a white heat.

An Interesting Exhibition

SYNOPSIS—A trip through the machinery exhibition held in connection with the American Mining Congress in Philadelphia. Various machines and appliances used directly and indirectly in the production of coal were here seen to good advantage.

The machinery exhibition carried on during the past week in connection with the American Mining Congress in Philadelphia, although perhaps somewhat disappointing in the matter of attendance, was both interesting and instructive. The exhibits shown occupied two floors of Horticultural Hall; the heavy machinery being placed upon the first floor, and the lighter apparatus above.

Upon both floors the exhibitors' booths were arranged along the outer walls of the building or placed back to back in the room. Three aisles were thus formed upon each floor with exhibits upon either side.



LOOKING DOWN ONE OF THE AISLES

Entering the right hand aisle on the second floor, the first exhibits seen were those of the Commercial Museum of Philadelphia, and the University of Pennsylvania. The next exhibit was that of J. S. McChesney & Co., of Chicago, Ill.; this consisted of mine supplies and wire hose ties. Beside this booth was that of the American Abrasive Metals Co., of New York, which exhibited floor plates and locomative brake shoes.

The next booth was that of the Draeger Oxygen Apparatus Co., of Pittsbugrh, Penn. Here the oxygen helmet and mouth piece breathing apparatus were exhibited in proper working order upon suitable wax figures. A pulmotor was also shown with its various attachments and attracted no small amount of attention from visitors.

Passing on down the aisle the visitor arrived in succession at the booths of Adam Cooks Sons, of New York, lubricant makers; the Ball Engine Co., of Erie, Penn., manufacturers of high grade engines; and the Davis Instrument Manufacturing Co., of Baltimore, Md., where a collection of high-grade anemometers and hygrometers might be seen.

The next exhibit was of the Scott rivetless manila transmission-rope sockets used in joining the ends of transmission rope. By means of these sockets, which are steel drop-forgings, a rope can be spliced in approximately 45 seconds, whereas several minutes are required to do the same work with a riveted socket. These sockets are manufactured and sold by John G. Scott, of Girardville, Penn.

The Witherbee Ignitor Co. had the next booth and exhibited their storage battery and cap lamp. The exhibit consisted of the lamps, batteries, cases, wire, etc. showing clearly the method of manipulation of these lamps. Directly across the aisle was the booth of Ackroyd & Best, Inc., of Pittsburgh, Penn., who had a good display of safety lamps and accessories.

At the extreme end of the passage was the exhibit of the Electrical Service Supplies Co., of Philadelphia, Penn. This consisted of Keystone truss pins, lock insulators, lamp-guards, porcelain strain insulators, protected rail bonds and the compressor for same, an automotoneer, Gargon-Daniels lightning arresters, a Keystone mine signal, also a mine telephone, an illuminated enameled "Safety-First" sign in several languages, a Crouse-Hinds mine headlight, and an extensive line of electrical material and specialties.

Along the second or center aisle of the building were the following exhibits: The Fairmont Mining and Machinery Co., of Fairmont, W. Va. This consisted of a small mine pump geared to a motor, both machines be-

ing mounted upon a mine truck for portable operation; a short section of track laid with this company's steel mine ties; also a model of a car retarder to facilitate loading railroad cars under tipples.

The next three booths were occupied by the Keystone Lubricating Co., of Philadelphia, with an exhibit of grease and grease cups, the Cyrus Borgner Co., of Philadelphia, with a nice exhibit of fire brick and clay products, and the West Virginia Rail Co., of Huntington, W. Va., with an exhibit of rails and fishplates.

The next booth was occupied by the American Steel & Wire Co., of New York. Here specimens of wire cables for aerial tramways, together with the travelers and grips used in this type of transmission were shown. Not the least interesting part of this exhibit was a joint in a lock-coil cable.

The Bureau of Safety Relief Sanitation and Welfare of the United States Steel Corporation exhibited photographs of welfare work, a special type of stretcher, etc., in the next booth, while the one next to that was held by

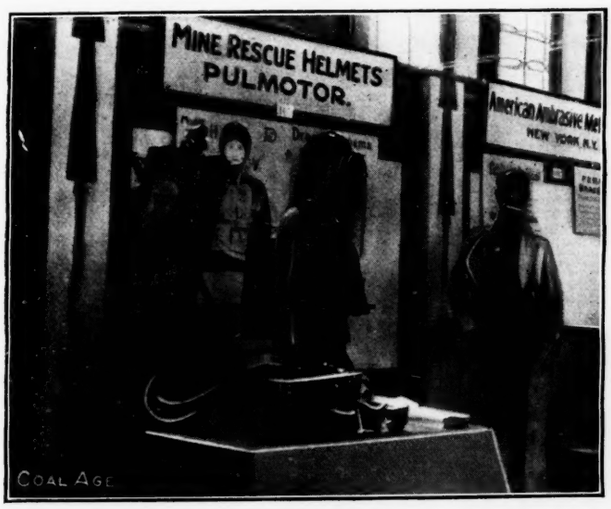


EXHIBIT OF THE DRAEGER OXYGEN APPARATUS CO.

the Universal Portland Cement Co., of Chicago, Pittsburgh and Minneapolis. Here were shown specimens of crushed limestone, granulated blast-furnace slag, a mixture of these raw materials, portland cement clinker and the finished cement.

Directly across the aisle from the exhibit of the Universal Portland Cement Co., was that of Johnson & Johnson, of New Brunswick, N. J. This was one of the most complete exhibits in the entire show, and consisted of various materials and appliances used in first-aid work, and also the first-aid cabinets, such as are kept ready for immediate use at many mines. The next booth was that of Henry Troemner, of Philadelphia, with a display of various sizes of laboratory scales and balances, while the Atlantic Refining Co., of Philadelphia and Pittsburgh, had an extensive exhibit of petroleum products in the next booth. Here was shown a working model of a series of oil wells pumped from a central station. A mine car wheel lubricated with some of this company's oil was kept continuously running (being belted to an electric motor) at the rate of approximately 30 miles per hour, and the journal box was absolutely cold.

The next exhibit was that of the Hazard Mfg. Co., of Wilkes-Barre. This firm is the maker of wire cables and hoisting rope. One of the most interesting parts of this display was a piece of hoisting rope which had broken loose accidentally from the drum of the engine and fallen down the shaft, and in so doing had become twisted and tied into an intricate knot, with many sharp bends. Despite this fact, however, a close examination of the rope failed to show the breaking of a single strand or wire.

The next booth was occupied by the Koehler Mfg. Co., of Marlboro, Mass., with an attractive display of safety lamps and igniters. The igniters above mentioned are built into and made a part of the safety lamps, and are so arranged that should for any reason the lamp become extinguished, the simple turning of a rod or thumb screw under the base of the lamp will cause a shower of sparks to fall upon the wick, reigniting it without the necessity of taking the lamp apart or of striking a match.

The Western Electric Co. in the next booth had a fine display of mine telephones for both surface and underground work, mine rescue telephones and the like.

The Hirsch Electric Mine Lamp Co., of Philadelphia, had the next exhibit in the side aisle. Here a small battery-charging plant was shown in operation. This consisted of a rack provided with suitable holders and terminals or fingers touching the terminals of the batteries.

The Streeter-Amet Weighing & Recording Co., of Chicago, exhibited in the next booth their automatic weight recorders for tipples, together with several photographs of various installations; while John Roeblings Sons, of Trenton, N. J., had the display adjoining. Here were shown steel cables and hoisting ropes and electric conductors.

The Justrite Manufacturing Co., of Chicago, Ill., occupied the next booth. An attractive display of various kinds and types of carbide lamps and lanterns with many unique features might here be seen. Among these latter might be mentioned a lamp which required no match to light, a vest pocket lamp-lighter and an ingenious pocket device for cleaning out the gas hole in a lamp tip.

The next exhibit was that of the American Concentrator Co., of Philadelphia. This firm is the manufacturer of coal and iron-ore preparation plants. No less than 13 types of jigging machines are built by this company, also magnetic separators, and to the best of their knowledge the only commercially successful centrifugal coal dryers upon the market.

The Lobdell Car Wheel Co., of Wilmington, Del., had a display of mine-car wheels and axles for locomotives in the next booth.

In the booth directly across the aisle from the one last mentioned, Keuffel & Esser Co., of New York, had an extensive and interesting display of surveying and drafting instruments. Among other devices of interest to mining men, they showed an improved anemometer with an increased range of accuracy. In the booth immediately adjoining this was a display of chemicals by Roessler & Hasslacher Chemical Co., of New York.

The Edison Storage Battery Co., of Orange, N. J., had the adjoining booth. Here were shown various sizes and types of the Edison storage battery varying in size from the single-celled battery for miners' head lamps to a 56-cell unit suitable for use on a mining locomotive.

The Link Belt Co. had the next booth. Here were shown photographs of various applications of this firm's hoisting and conveying machinery, covering practically the entire coal-mining field.

The Main Belting Co., of Philadelphia, occupied the remaining space upon this floor. Here was shown an apparatus demonstrating that Anaconda belts would carry wet material. A conveying belt was also exhibited which was approximately 8 ft. wide.

Upon the lower floor of the building the Jeffrey Mfg. Co. exhibited a 60-hp. storage-battery and trolley locomotive. This machine was designed as a combination haulage and gathering motor. A heavy-duty short-wall mining machine, a single-roll coal crusher, and Hess-Bright ball bearings as used for locomotive armatures were also shown.

The Goodman Mfg. Co., of Chicago, displayed a coal puncher driven by an electric motor, and built in 1888. Also a five-ton gathering locomotive with cable reel, and a short-wall coal cutter.

The Milwaukee Locomotive Co., of Milwaukee, Wis., had on display a seven-ton, 35 hp., gasoline locomotive. This machine was equipped and driven with an engine of four cylinders, each 6x6 in.

The Baldwin Locomotive Works and the Westinghouse Electric & Mfg. Co. exhibited an electric locomotive

An Elaborate and Attractive Exhibit

equipped with both the ordinary or straight trolley pole, and a jointed or type D-20 trolley. This machine was ten tons in weight, and equipped with an 86 h.p. motor. It was built with the bar-steel side frame.

The Electric Storage Battery Co., of Philadelphia, exhibited their iron-clad exide battery for motor vehicles. A complete unit of 20 cells was here on exhibition.

A working model of an over-wind and over-speed controller was exhibited by the Welch Hoisting Controller Co., of Pittsburgh. This was a miniature hoisting engine, provided with a model of a shaft and head frame. The engine was equipped with a controlling device which effectually prevented either over-winding or over-speeding.

The Alexander Milburn Co., of Baltimore, had a good display of carbide lanters and headlights, and devices for illumination when isolated work must be done at night, or in dark places.

The exhibit of the General Electric Co. consisted of photographs of various installations which had been made, while the Williams Patent Crusher & Pulverizer Co., of St. Louis, had a full-sized crusher in working order and equipped with an improved belt pulley, also a small finished cylinder showing the arrangement and attachment of the hammers.

The C. O. Bartlett & Snow Co., of Cleveland and New York, had upon exhibition a large-sized working model of their coal-handling machinery.

The Hyatt Roller Bearing Co., of Newark, N. J., had an interesting exhibition of their roller bearings as applied to mine car wheels. They also showed the rollers, cages and bushings, separate from wheels of any kind.

The Lead Lined Iron Pipe Co., of Wakefield, Mass., had on display various lead- and tin-lined fittings, and sections of lead- and tin-lined pipes, while the Vulcan Iron Works, of Wilkes-Barre, Penn., showed photographs of their various installations, the attendant being ready to answer any questions which might be asked.

As stated in the beginning, the exhibition in whole and in detail was both interesting and instructive. It was well worth anyone's time to pass through the various rooms and see the types of machinery which are used in the mining and preparation of coal. The tools and appliances here shown were of course the most modern and up-to-date that are in use at the present time. Most of the articles exhibited, with the exception, of course, of the models, were stock materials and not built or finished especially for the occasion.

The True Romance

By Berton Braley

From "American Machinist."

"Romance is dead?"—The Foreman smiled
As he would at the words of a foolish child:
"Romance is dead?"—Why, man you're blind—
If you'd listen and learn with an open mind
Instead of speaking in parrot phrase
Of the 'grand old times' and 'the good old days;'
If you'd look about you and SEE, you'd find
Romance is living right now and here,
Not dead and gone with the yesteryear!

"Man, O man! can't you look and see
What thousands of wonders have come to be?
These bolts and shafting that whirl and whir,
These chunky motors that hum and pur,
These lathes and punches which fill the floor
These hammers pounding, these rolls that roar,
Why—THEY'RE Romance—and they make it, too,
By the magic spell of the work they do;
These tools of ours and the men who run them,
Don't DREAM of miracles—they've DONE them;
They've put Romance in the shape of steel,
They've turned the shafts and they've forged the keel
Of many a ship that fights her way
Through surging combers and flying spray;
The train that thunders along the rails,
The ax that blazes the new-made trails,
The cages that carry the miners down,
The dynamos lighting the clanging town,
The aëroplane in the sky's blue dome,
The plowshare, turning the good brown loam,
The myriad wonders of the time
Have sprung to life from the workshop's grime;
And yet you sigh, and you shake your head
And murmur sadly, 'Romance is dead!'"

Coal-Mine Accounting Systems

By J. B. L. Hornblower*

SYNOPSIS—Some comments on accounting methods in general with particular reference to those of the Pittsburgh Coal Co. Systems of accounting vary widely with different companies and may lead to a great deal of confusion. Plant and equipment depreciation are especially troublesome items to handle intelligently.

It is with some misgivings that I undertake, at the request of the officers of this Convention, to lead in the presentation of the subject "Mining Costs"; not that the subject is one unworthy of your time and attention, nor that my study of it has been meager or superficial, but because the matter of the proper construction of mining cost accounts and the use of the same by those vitally interested does not usually receive the attention and consideration which it deserves. Perhaps this fact influenced your officers in introducing a paper on the subject and inviting your attention to its consideration and discussion. However this may be, I believe that the subject is one of great importance and I therefore have consented to discuss it, more in the hope of emphasizing certain things, than of presenting any new or startling views upon it.

First. Who are interested in mining costs? The foremen, superintendents, general managers, executive officers, boards of directors and stockholders. The viewpoints of these respective classes are different, but all are, or should be, greatly concerned to secure the truth, the whole truth and nothing but the truth. Carelessness and indifference as to statements made are, in the last analysis, of the same texture as wilfullness and misrepresentation and frequently lead to the same disastrous results.

Second. How may these statements be made to most accurately and clearly set forth the information concerning actual conditions, which is so necessary to those whose capital and reputations are at stake?

The limit of time you will fix for the consideration of this subject, among the many other important matters which are to engage your attention, makes it necessary for me to avoid details as much as possible—to outline rather than elaborate.

Interest and Taxes

Interest on capital invested in lands, mining rights, plants and equipments, and discount on bonds issued against such investments, should not be charged to mining cost. Interest on bonds sold for the purpose of constructing specific plants is commonly charged to such construction cost up to the time when the plants are ready for operation, but this practice easily runs into an abuse and a misrepresentation to bondholders, stockholders and the public.

An operating company will not err but rather commend itself to all concerned by holding to an absolute rule not to capitalize interest under any circumstances. Many companies in the past, which sold bonds for less than face value, charged such discount to property or construction account, but this practice is now less common and will doubtless gradually disappear in companies which wish to be credited with conservative management and frankness in reports to stockholders and the public.

Taxes in an operating company should be charged to operations, never to property. The amount of tax chargeable to the operation of a given mine ought to be, as nearly as may be, the tax upon the land which will ultimately be operated through that mine, and the tax for a given year should be apportioned in equal amounts over the divisions of the year for which cost statements are made.

Royalty or Property Depletion

The value of coal or mineral rights, at cost, should be extinguished at a charge to operations in a fixed amount per ton or per acre as the property is exhausted. Some companies have revalued lands on their books and so created a surplus. This, in probably every case, was not a wise thing to do. Assuming that the transaction was thoroughly honest in intent, properly shown on the books of the company as a surplus not derived from operations, and properly followed up by increased charges to future operations for exhaustion, it will appear in the last analysis to be simply reaching into the future.

I would say, therefore, that while such revaluation in some cases may seem to be justified, in most cases it is a thing which ought not to be done. If the lands are really worth more from year to year than their first cost, the fact will be reflected in increased selling value of the product. The difference of value, believed or hoped to exist, ought not to be put into surplus account in advance of actual sales of product, thereby increasing, in a fictitious way the mining cost of the future. In other words, it is wiser and more conservative to book earnings as they are actually realized, not as anticipated or hoped for.

Depreciation of Plant and Equipment

There is, perhaps, no single phase of accounting, whether of mining or manufacturing companies, more complex or troublesome, than this matter of plant and equipment depreciation; hence nothing in which there are more differences of opinion and method of procedure among operating companies and I might add, nothing in which managements and accountants more easily, and with the best intentions, deceive themselves and each other. The views, plans and methods herein set forth are, therefore, not necessarily standard—they are more or less the result of my personal study and experience.

Up to the time when a mine is placed on an operating basis, ready to produce the daily tonnage for which its development, plant and equipment were planned (regardless of what it actually does produce at that time, determined perhaps by the law of supply and demand, labor or weather conditions or car supply) all expenditures for development, plant and equipment should be charged to construction account with credit to that account for product sold in the full sum realized for the same. After the projected development has been completed and the mine placed on an operating basis, all expenditures made

*Comptroller, Pittsburgh Coal Co.

Note—An address before the 16th annual convention of the American Mining Congress, Philadelphia, Oct. 20 to 24, 1913.

during the whole course of its life, whether for development, air shafts, mine cars, power equipment or lines, or anything that may be installed, should be charged to operations, unless such expenditures result in positive increase of capacity; in this case they may be charged to capital investment with a proper regard to the question of the length of time that such additions may reasonably be expected to serve.

Further charges should be made to mining cost monthly in fixed uniform amounts, with credit to a fund account generally known as plant and equipment depreciation fund, for the replacement of capital originally invested in such development, plant and equipment, or for the replacement of units which wear out or become obsolete. The extent to which this fund may be used for replacements or renewal in kind must be determined by the rate at which the fund is accummulated. If the rate is low and a long period, perhaps the entire life of the mine, is consumed in charging operations with the full amount of the original investment (less salvage), obviously no replacements or renewals should be charged against or paid out of the fund; all must be charged to operations. If the rate be made high enough so that a much shorter period is consumed in getting into the fund the full value of the original investment through charges to operations, certain replacements, renewals, or improvements may be charged against the fund.

The company with which I am connected now follows the uniform rule of charging operations with depreciation of plant and equipment at the rate of 6 per cent. per annum on net (or reducing) values, with credit to depreciation fund. This will cover into the fund about 70 per cent. of the original value in twenty years; it is contemplated that salvage values, that is, the values of all equipment scrapped, or removed for use at other points during that period, together with the remainder value, credited to the fund will make up the 30 per cent. of balance of original value not charged to operations.

We, therefore, do not charge any renewals or replacements against our depreciation fund accumulation, but charge them all to operations; when the charges are so large as to seriously impair monthly comparisons of cost they are spread over the operations of a few months.

Labor, Supplies and Fuel

In the Pittsburgh coal-mining district, labor costs fall into two general divisions: First, that which is paid on a unit basis of work performed, such as the scale rate for pick mining, machine mining, subdivided into cutting and loading, and dead work, such as yardage, room turning, breakthroughs, clay veins, etc.; and, second, that which is paid on a pier diem basis, such as motormen, drivers, general inside labor, tipple labor, general outside labor, electricians, etc. It would hardly be profitable to follow the subdivisions of labor in this paper; they differ, of course, with changing conditions.

All expenditures for live stock and supplies, after the initial installation at a new mine, should be charged to operations as made. For purposes of checking, and accuracy in monthly comparisons of cost, inventories should be taken at the close of each month and entries made debiting inventory account, with credit to operations, for unused supplies at cost and for live stock in the service at a fair valuation, taking to account wear and tear.

The mining-cost statement at a mine depending upon its own power plant, which does not include a charge for coal consumed in the same is incomplete and apt to be misleading in comparisons with mines purchasing power from central stations. For this reason it is proper to charge the fuel at a representative value to operations, with credit to coal-sales account, notwithstanding that operations have already been charged with all the items entering into the cost of the product so consumed. This treatment of the individual power-plant fuel, of course must not be lost sight of in the general summary of business done.

Insurance and General Expense

Fire, tornado, boiler and employer's liability insurance premiums are increasingly important as items to be taken to account in mining costs whether these hazards are covered by insurance companies or assumed by the operator. In the latter case a fund or funds should be created and maintained at a charge to operations in sufficient amount to pay all losses, and, conservatism suggests, to accumulate a reasonable surplus.

General office expense and other general expense should be incorporated in mining-cost statements in order to get a total outside amount of cost upon which to base selling values; they should, however, be shown separately under appropriate headings, not being included in any of the subdivisions of "Cost at Mine." In a company conducted exclusively as a mining company it is, perhaps, better not to differentiate nicely between that portion of general office expense, which is chargeable direct to mining, such as the operating and engineering departments, and the expenses of departments of sales, transportation, finance, accounts, etc. In a broad sense, the base of all the company's business is the production of its mines, hence all of its general office expense may properly be included as a part of its total mining cost.

FORM OF COST STATEMENT OF A TYPICAL BITUMINOUS MINE, PITTSBURGH DISTRICT

	Operating Days	
Production in Tons of Run-of-Mine		Tons
	1¼-in. lump	%
	Small sizes	%
	Total	%
	Pick mined	%
	Machine mined	%
	Total	%
	Cost per Ton	
Pick mining		$
Machine mining		
Yardage		
Room turning		
Break through		
Clay veins, spars, etc.		
Drainage and ventilation		
Animal haulage		
Mechanical haulage		
General inside labor		
Tipple labor		
General outside labor		
Supt., clerks, pit and fire bosses		
Mining machine repairs		
Mining machine expense		
Pit car repairs		
Pit rails and ties		
Pit posts and cans		
"T" iron and spikes		
Power plant expense		
Stable expense		
General expense at mine		
General repairs		
Total direct charges		=
	Labor	$
	Supplies	
	Fuel	
	Royalty	
	Depreciation	
	Taxes, insurance and other general Expense	
	General office Expense	
	Total	$

An Improved Anemometer

One of the most common and yet most important, instruments, in mining practice, is the Biram anemometer with which every mine foreman is familiar. This instrument is to the mine foreman what the Davy lamp is to the fireboss—his constant companion. Many of the features of the old Biram instrument have always proved a source of annoyance and error. Owing to these defects, which were often unappreciated by the foreman using the instrument, it was common to find frequent disagreement in the results obtained by the use of different instruments.

It is well known that this instrument, as formerly designed, would gradually fail by use; in other words, it would not stand up to its calibration, owing to the tendency of the twisted arms supporting the blades to untwist. This would cause the instrument to record a higher velocity than the actual. Another source of error was due to the fact that the dial hands did not cease to move instantly when the instrument was thrown out of gear. In some makes of these instruments, this formed an important defect; also the jewel bearings used were subject to considerable wear, in the hard usage common to mining practice.

A careful study of these defects has enabled the Davis Instrument Manufacturing Company, Inc., to design an instrument that is destined to give universal satisfaction. The movement is American, manufactured in the shops of the company, at Baltimore; and is peculiarly the design of Alfred U. Davis, vice-president of the company and superintendent of the shop. It will be remembered that the father, Herbert Davis, was formerly the American reresentative of the English firm, John Davis & Sons, where Alfred Davis served his apprenticeship before coming to this country.The latter has since been employed in the shops of the General Electric and the Westinghouse companies.

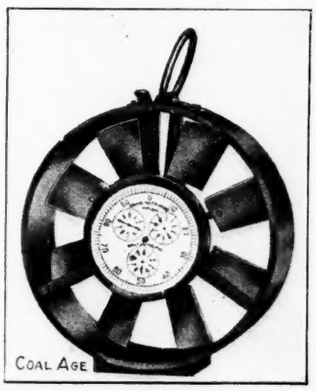


FIG. 1. THE AMERICAN DAVIS ANEMOMETER

The American Davis anemometer, shown in Fig. 1, like the American watch movement, is standardized throughout, and each individual part is quickly replaceable, making the instrument easy to repair, in case of breakage owing to accident. An important feature in this instrument is that the arms, which are of hollow brass, are stamped at the proper angle to receive and hold the alumninum blades. The system of manufacture, in this respect, is so complete that the finished instrument needs no calibration; but when tested, as every instrument is tested before leaving the shop, the reading is found to be correct. This fact alone shows the precision of the system. Instead of jewels, the bearings are steel on hard bronze, which give greater permanency and satisfaction. These instruments, unlike others, do not give increasingly higher readings with continued use, and stand up better to their performance in the higher velocities common to mining practice. By an ingenious arrangement, the dial hands are brought to rest instantly when the instrument is thrown out of gear.

HAVE STOOD THE TESTS

An interesting feature in connection with these instruments is the manner in which they have stood the tests of the Bureau of Standards, at Washington, D. C. The instrument is calibrated for an exact reading at a velocity of 500 ft. per min. In common with other anemometers, the dial readings, for higher velocities, are in excess and, for lower velocities, fall short of the actual.

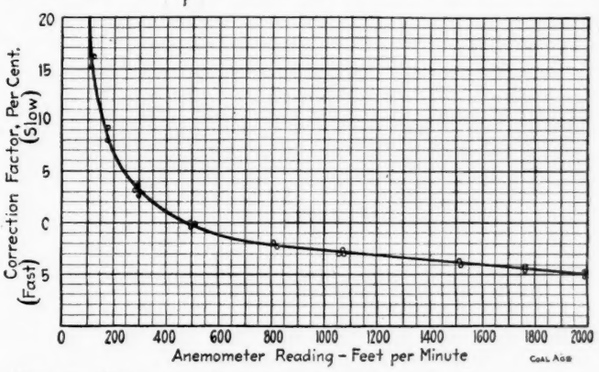


FIG. 2. DIAGRAM SHOWING PERCENTAGE CORRECTION OF ANEMOMETER READINGS

The accompanying diagram (Fig. 2) shows the corrections to be made for such higher or lower velocities. For example, the dial reading of 500 ft. per min. is correct and corresponds to the actual velocity of the air current. A dial reading of 800 ft. per min. must be reduced 2 per cent., giving an actual velocity of 784 ft. per min. In the same manner, a velocity of 2000 ft. per min. must be reduced 5 per cent., giving a velocity of 1900 ft. per min. On the other hand, a velocity of, say 160 ft. per min., must be increased 10 per cent., giving an actual velocity of 176 ft. per min. The test of the Bureau of Standards corroborated this chart and the calibration of the instrument in a remarkable manner, as shown by the small circles that indicate the results of the test at several different velocities.

COMING SOCIETY MEETINGS

The Coal Mining Institute of America will hold its winter meeting at the Fort Pitt Hotel, Pittsburgh, Penn., Dec. 4 and 5. C. L. Fay, Wilkes-Barre, Penn., is secretary.

The Rocky Mountain Coal-Mining Institute has decided to postpone indefinitely the November meeting which was booked for Denver. This decision is due to the serious strike situation which now exists in Colorado. F. W. Whiteside, Denver, Colo., is secretary.

The Engineers' Society of Western Pennsylvania will hold its bimonthly meeting in the Society Rooms, Oliver Building, Pittsburgh, on Tuesday, Nov. 4, at 8 p.m. The subject of the meeting will be, "Design of Linings for Mine Shafts," by W. A. Weldin, assistant chief engineer of the Pittsburgh-Buffalo Co. Discussion will be presented by a number of structural and mining engineers. Elmer K. Hiles, Oliver Building, Pittsburgh, Penn., is secretary.

The Engineers' Society of Western Pennsylvania and the **Cleveland Engineering Society,** at the invitation of the Pressed Steel Car Co. and the Universal Portland Cement Co., will inspect the works of these two companies Saturday, Nov. 1.

West Virginia Coal Mining Institute will hold its winter meeting at Charleston, W. Va., on Dec. 8, 9 and 10. Neil Robinson, Charleston, W. Va., is president; E. N. Zern, Morgantown, W. Va., is secretary.

Session of the American Mining Congress

By R. Dawson Hall

SYNOPSIS—The congress discussed the various politico-economic aspects of mining, such as the taxation of mining property, the sale of public mineral lands, the inadequate returns in the coal industry, the wages of labor and workmen's compensation. Carl Scholz was elected president. The association showed its interest in the promotion of broad national policies regardless of mere personal interest and manifested a sentiment in favor of governmental regulation which should control the profits and operating methods of all mines so as to protect the public and conserve resources.

The American Mining Congress opened its 16th Annual Session on the afternoon of Oct. 20, in the ballroom of the Bellevue-Stratford Hotel. The meeting was called to order by F. H. Wigton, chairman of the local executive committee. After a few opening remarks, an eloquent address of welcome was delivered in the name of the mayor and citizens of Philadelphia by Ed. F. Cattell, statistician of the city. Mr. Cattell was associated in a mining capacity with D. W. Brunton in his earlier years.

Members and Delegates of the American Mining Congress

Responses were made on behalf of the congress by D. W. Brunton, the president, and by the following representatives of the states taking part in the meeting: W. Malmey, of Alaska; W. H. Fluker, of Georgia; C. J. Norwood, of Kentucky; I. R. Burton, of New York; H. N. Lawrie, of Oregon; I. Broman, of Texas; Neil Robinson, of West Virginia, and P. J. Quealey, of Wyoming.

In the evening session, D. W. Brunton, of Denver, Colo., delivered his presidential address, and the members spent the balance of the evening at a theatrical performance.

Taxation on Output

On the following morning the congress met at 10:30 and R. V. Norris opened the meeting with a paper on the taxation of mining property. He reviewed the systems in use for assessing property and asserted that, though not conformable with the state constitution, the most correct method of assessment was by basing the taxes on the value of the output. He was not indisposed, however, to admit that such a method of taxation was open to criticism. It appeared to him as the best solution of a much vexed problem. Speaking, of course, from an anthracite standpoint, his conclusions could not be subjected to severe criticism, for most of the land is held in that section for future development, but in the bituminous fields the exemption of lands from taxation, which were not being worked, would render the holding of land for speculative purposes a more profitable business than it now is. Some sections of the country are already sufficiently retarded in development by speculators.

It is true, however, this delay assures us that when mining does commence, proper conservation of resources will have replaced present wasteful methods and more-over in places where mining is already commenced, there will be less waste of mineral as a result of reduced pressure from taxation. The present system tends to put a premium on rapid and incomplete exhaustion of resources, so that only the best of the mineral is removed.

Antiquated Tax Laws

D. L. Webb, of Denver, Colo., then read a paper, in which he said that taxation of mines was based on laws which were originally framed to apply to surface lands only. The value of mineral below ground is so uncertain that taxation should be not on the value of the holding, which is largely indeterminate, but on the value of the net output only. Taxes on mineral as land might be fixed at $5 per acre, but any larger tax should be based on mineral extracted and sold.

H. L. Smyth, of Cambridge, Mass., declared that the Minnesota taxes formerly ran 10c. per ton of output; this dropped slowly by steps to 1c., and finally was entirely removed. The specific taxes per ton were considered inequitable because they did not bear any reference to costs of production nor were they related to the value of the product obtained.

The Finlay System

The J. R. Finlay valuation is now generally acceptable, though made after too hurried an inquiry and having needed some modification. A change was desired and applied to his rules relative to the calculation of resources in depth and extent. Two suits are pending relative to his assessments. Although the burden of taxation was increased throughout the state from three- to twenty-fold, the mine operators realized that the taxes were based on a rule which would prevent exorbitant taxation, such as might be levied if the tax were dependent not on probable profits, but on output. Moreover, as the assessment was state-wide, there was now no fear that unequal taxation would result from divergences in local judgment of property values.

Taxes on Profits

W. L. Griffiths spoke in favor of taxes on output, saying that the burden should be placed, for the larger part at least, on the going concerns. Coal lands which were idle should not be taxed. A tax on profits would be welcomed by some coal companies in the anthracite region as they would escape such a burden entirely, seeing that mining was pursued year after year at a loss, the deficit being made good by railroad profits.

H. M. Chance, of Philadelphia, Penn., read a paper on taxation of a character so comprehensive that it is impossible to brief his remarks. E. T. Conner, of Philadelphia, Penn., who was scheduled to speak in reply to the three papers, was unable to be present. He is laid up in the Hahnemann Hospital with appendicitis.

Interminable Mine Reports

S. A. Taylor then read a paper on "Uniform Requirements for Official Mine Reports," in which he said that there was excessive duplication in state and federal reports, so that it took a clerk 2 to 3 weeks each year to make the required returns. He proposed a consultation so that even if a number of reports had to be rendered, they would all follow similar lines, be based on the same period of time and so be mere replicas one of the other. He paid a tribute to the rapidity with which the statistical reports of the United States Geological Survey were produced.

In the afternoon the members took a trip to the League Island Navy Yard and other points of interest in the harbor of Philadelphia. When the evening session opened W. H. Wilson, engineer-in-charge of the Pittsburgh Station of the Bureau of Mines, urged the congress to join with all the other coal- and metal-mining bodies in meeting with the American Mine Safety Association, once every three years, and specifically in 1914, at a time and place to be determined at their mutual convenience.

Use of Explosives

Later R. W. Gunnell, of the Atlas Powder Co., gave a talk on "The Use and Abuse of Explosives." Mr. Gunnell said that the efficient and safe use of explosives was so important as to justify the continuous employment of an explosives' engineer by all large mining companies. He declared that the low-grade ammonia and gelatin explosives were least sensitive to shock and should therefore be fired by the strongest of detonators. Where different types of explosives are in use, the detonator chosen should be fitted for the least sensitive and not for high-grade dynamites.

Assembled outside Bellevue-Stratford Hotel in Philadelphia

Nos. 3 and 4 detonators have passed out of use almost entirely, and No. 5 will probably soon follow. Nos. 6 and 7 will be preferred and possibly No. 8 may be extensively used, for only a strong detonator and one fully equal to its work will effectually obtain the full power of the explosive used. Single-tape fuse is not recommended, for, though it is well suited for dry holes, it may, and probably will, find its way into wet places and then not being waterproofed may cause misfires.

Why Dynamite Is Not Moisture-Proof

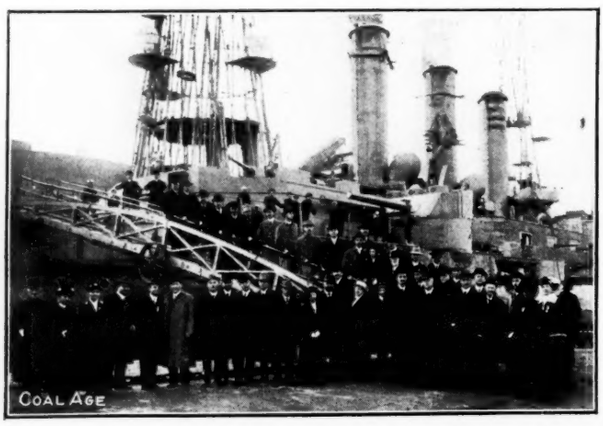
By picking out the white crystals in dynamite and exposing them on a window sill for a few hours, it will be easily understood why dynamite is susceptible to moisture. In a short time the crystals will attract enough dampness to form a mass of water. The crystals are nitrate of soda or nitrate of ammonia and not parts of the dynamite proper, but are invariably found in the commercial article.

But there is another reason why dynamite is not absolutely resistant to moisture. The absorbent material is more willing to soak up water than nitroglycerin, and a certain 10 per cent. dynamite was found recently on

analysis to have replaced 4 per cent. of the explosive material with water. At about 43 deg. F., dynamite will freeze and can be detonated only with difficulty or not at all, depending on the degree of solidity with which it is frozen. Blasting caps are cheaper than electric fuses and have no other advantages, the more expensive article giving far safer results in practice.

When the Fan Should Be Stopped

At the close of Gunnell's address, a paper was read on "Mine Rescue and First-Aid Operations," by J. W. Paul, engineer in charge of mine-rescue work of the Bureau of Mines. He made several interesting statements, and among them are the following:



THE CONGRESS VISITING LEAGUE ISLAND NAVY YARD. "MINNESOTA" IN REAR

Incidents might be cited where lives would have been seriously jeopardized if the ventilating current had been restored to its normal course, prior to the exploration of the mines, by men wearing breathing apparatus. I have in mind several mines from which live men were rescued only because ventilation was not restored in the part of the mine in which they had remained following an explosion or mine fire. In these cases breathing apparatus was the important factor in their rescue.

DELAY EXPLORATION OF WRECKED PORTIONS OF MINE

Those parts of the mine which indicate the least physical violence should be the first to be explored, since in those quarters there is the greater chance of finding live men. In those parts of the mine where great physical violence is manifest, such as wrecked cars, distorted tracks and broken machinery, the probability of finding life is remote. However, after the outlying districts in which men were known to be at work or districts to which the men may have retreated for safety have been explored, the innermost workings should be examined to ascertain the presence of fire which frequently follows a mine explosion. The discovery and extinction of a fire by the rescuers may prevent a second explosion when the ventilation is restored, especially if the mine liberates explosive gas.

A rescue crew wearing breathing apparatus should consist of a unit of not less than five well-trained men. Each unit when in the advance should be supported by a similar unit acting as a reserve at the base. The presence of a reserve crew has been fully justified in actual rescue operations as being most essential to the safety of the advance crew.

A crew should not proceed into irrespirable gases a distance beyond which it would be able to carry one of its members to fresh air. This distance necessarily is governed by the character of the road over which the crew may travel and the nature of the obstructions passed over.

PRECAUTIONS BEFORE ENTERING MINE

The physical condition of the men composing a rescue crew should be determined by a physician prior to the crew's engaging in rescue exploration work. Only such as are in good health and have no organic physiological defects should be permitted to engage in rescue work involving the use of breathing apparatus. During the progress of the work, at the beginning and termination of each shift, the pulse and respiration of each man should be taken and recorded.

The apparatus should be carefully examined and tested by a competent person as well as by each member of the crew and a record kept of each test. Just prior to entering the mine, the crew should wear the apparatus in the presence of formaldehyde gas to determine if all parts are secure against the admission of external air. Sulphur dioxide is not so well adopted for testing the apparatus since it is absorbed by the caustic potash or caustic soda in the regenerator.

DIFFICULTIES IN USE OF BREATHING APPARATUS

All types of breathing apparatus using compressed oxygen as the source of the breathable air should be so constructed that the entire circulating system may be put under pressure by the admission of oxygen or compressed air. This method would admit of determining a leakage under a pressure less than that required to operate the relief valve. A water gage placed on the circuit would plainly indicate any loss of pressure due to leakage. The surplus oxygen which is generally left in the oxygen-supply tanks could well be used for making such tests.

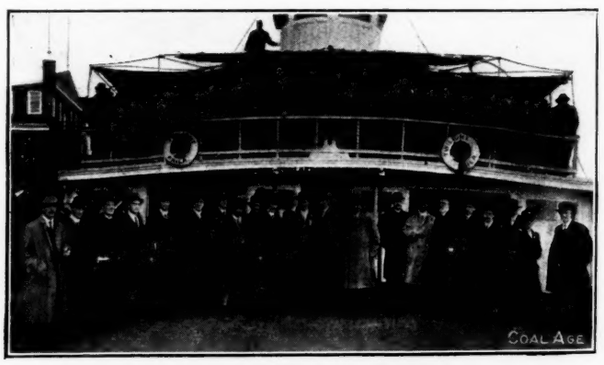
The flow of oxygen in two German types of breathing apparatus—the Draeger and Westfalia depends upon the joint use of a reducing valve and an injector nozzle, whereas the English type of Fleuss-Proto depends upon the single action of a reducing valve, the injector nozzle being eliminated.

The above emphasizes the importance of frequent examination of the injector nozzle to insure against its clogging with caustic potash which may be carried over from the regenerator and deposited in the injector compartment.

HANDLING RESCUE SQUADS

In order that rescue work may continue without cessation, the crews should be organized in parties of five including a captain. Two crews should constitute a brigade and their hours of work and rest should coincide. By the use of eight crews, constituting four brigades, which will necessitate the services of forty men, the brigades may work in shifts of four hours and rest for six hours and have two hours in which to eat and test the apparatus.

Recent mine-rescue maneuvers, held at Pittsburgh, Penn., and Rock Springs, Wyo., demonstrated that the above plan is practicable and that for continuous duty exceeding 48 hours, the crews should not be required to undergo more than two periods of 4 hours' duration in 24 hr. These periods of 4 hr. should be divided so that each crew will work alternately 1½ hr. at advance and reserve.



THE CONGRESS INSPECTING THE HARBOR OF PHILADELPHIA, PENN.

Mr. Paul also advocated the use of joint rescue stations because some operators have, in the past, purchased equipment and not provided for its proper upkeep and for the efficient training of the men. George S. Rice then spoke on the urgent need for such training and emphasized the importance of maintaining breathing apparatus in the utmost efficiency while H. M. Wilson spoke of the work of the Bureau in spreading all over the United States those means of safety which had been developed here and abroad and on the creation of a sentiment toward better methods. While a strong presentation of the claims of the Bureau to public recognition and support, it may be safely said that there was not a

word of exaggeration in his claims. He stated that it was the only governmental organization which had been afforded opportunity of having speakers all over the country proselytizing for safety and that as the Secretary of Commerce Redfield had recently said no great reform can come in the United States by force of law, however well that law may be backed by active officers. There must come such a change of viewpoint that the law will be practically a dead letter for most of the people. The bulk of the operators must first be induced to see that the law is an expression of a moral necessity before it is forced on the unwilling and negligent.

Following were two papers, one on "The Use of Concrete in Mining Operations" (illustrated), by E. C. Sargent, of Chicago, Ill., and another on "The Coal Resources of Alaska" (illustrated), by Dr. W. R. Crane, of State College, Penn. They are both too diverse and dependent on illustration to suffer any review.

On Wednesday morning the address of Dr. James Douglas, of New York, on "The Public Lands," was read by the secretary, and D. B. Rushmore, of Schenectady, addressed the congress on "The Industrial Corporation and Scientific Research." This latter was regarded as one of the most important presented.

At the afternoon session, George Otis Smith, director of the U. S. Geological Survey, gave a "Plain Talk" on the public lands questions. On the whole Mr. Smith's paper deserves approval but it makes no reference to the high price for which he thinks public lands should be sold or leased, and it does not pay any regard to the extended time during which land is held prior to classification and sale.

The Leasing System for Coal Lands

John F. Shafroth, the senator from Colorado, gave an address in reply. He stated that when he became governor of his state, he endeavored to find what was the cause for the inadequate tax return and he found in one county alone, 9-10ths of the acreage was withdrawn from entry and, as it belonged to the United States, could not be taxed. He did not oppose the placing of high valuations on coal land so much as he did its continued withdrawal from entry or its leasing by the United States government. Such a continuance of the national holding would exempt large areas from taxation and subject the citizens of Colorado to direct federal control in their business.

Why Coal Lands Should Be Sold

The burden of government was greater on the state than on the nation as the state had to employ more officials per thousand inhabitants than had the Federal government and the expenses could not be met if only a part of the state domain were subject to taxation, the cost of administration being dependant more on the density of population than on the actual numbers The interposition of vacant government land made administration extremely difficult. The $15,000,000 paid by Colorado in federal taxation brought her but little, seeing that the army and navy were of little avail to a people snugly placed in the heart of a continent, nor had Colorado much interest in harbors and rivers. She *was* interested however, in 50,000,000 acres of forest land, within her borders, which were idle and not open to entry; 40 per cent. of it was above timber line, 30 per cent. had only scrub timber, and the 30 per cent that remained would, according to the U. S. Agricultural Department, only grow a tree 19-in. in diameter in 200 years. She was interested in 9,425,000 acres of coal land in Colorado, which could not now be purchased at any price and might later be offered for $400 per acre, yet, if figured with all the land purchases of the federal government, it cost the United States only 4.7c. per acre.

Who Receives the Money for Coal Land

A delegate from the Land Office declared that this money paid in to the department was delivered to the reclamation service to be used in the irrigation of the Western arid lands, but Shafroth replied that eventually it was returned to the government by the farmers thus benefited so that it constituted only a loan and not a *return* of the capital to the settlers who had built up the West.

Several took part in the discussion and it was interesting to note that there was no attempt among Westerners to defend "dummy entries." The West, as one said does not wish to renew the past. While dummy entries are and were necessary to gather together a sufficient acreage for operation, it is better to change the law than to attempt its violation.

Thos. J. Walsh, senator from Montana and chairman of the Senate Committee on Mines and Mining, was willing to approve of a leasing system for oil and gas but not for coal and other minerals.

At the evening session, Dr. Chas. R. Van Hise, president of Wisconsin University, Madison, Wis., read his address on "The Relation of Big Business to Industrial Prosperity with Special Reference to Mining," in which he showed the fatuousness of a return to the small plants and small aggregations of capital of former years and doubted whether it would prove true that combinations of the largest size were too unwieldy for efficiency.

The morning session of Oct. 23 opened with the report of the Committee on Nominations which named 4 directors to serve 3 years or until their successors were elected. These were E. A. Montgomery, Los Angeles, Calif.; Hennen Jennings, Washington, D. C.; W. F. Richards, Pottsville, Penn.; and M. S. Kemmerer, New York, N. Y.

Chas. E. Van Barneveld, of San Francisco, Calif., then read an address on "The Mineral Division of the Panama-Pacific Exposition," inviting mineral displays on that occasion and asking that the American Mining Congress meet at San Francisco in 1915, during the life of the exposition. S. A. Taylor then proposed that as the work of the congress was constantly growing and as there was a continual deficit in the treasury, a Ways and Means Committee be formed to draft a scheme for making expenditures and receipts balance.

The Ills of the Coal Industry

Dr. E. W. Parker then read an address on "The Cost of Coal Production" and a substitute for John W. Boileau, of Pittsburgh, Penn., delivered his remarks on "What is the Matter with the Coal Mining Industry." Apparently he thought the main trouble was the abstention of the industry from the meetings of congress. As he was not present perhaps his opinion may be discounted; certainly his example should not be followed.

The discussion was lead by A. J. Moorshead. He regarded debate as of no value so long as the people of one state were rejoicing in the laxity of their own mining laws and chortling over the severity of those in

neighboring states. Mr. Moorshead declared that the workmen 's compensation law and the requirement that fire-proof structures be erected near, within and around the shaft below ground met with due approval in Indiana. They were, the Indiana operators thought, good measures so long as Illinois alone confronted them. Moreover, the wage difficulty made coöperation across state lines impossible.

A Possible Self Cure

However, despite Mr. Moorshead's prognostications, gloomy, though cheerfully expressed, it would seem that when all the fields are opened up and territory adjusted, the question of meeting competition will be less fierce and ultimately the disturbing forces will be those very states, whose territory has been curtailed by adverse legislation and labor activity. When the less afflicted states move up slowly into line, their territory holding will be slowly and surely reduced, as they meet the increasing demand of the labor unions and the state.

It appears that in a few years, war will almost cease because to a large extent, as there will be no new fields to open up in the East, the lines of every field will be more firmly fixed and the mines established will be satisfied with the area within these lines. When new counties and states are being opened the balance of power is often rudely disturbed.

It is, however, to be hoped that state's rights will never be pressed to such an extent that unequal safety will result. The right to keep unsafe mines in order to maintain a market gained by such methods is not a right for which honest men will strive and it is time that the laws of all the states be made to give at least equal security, even if it is not necessary to impose equal burdens on all.

Coal Operators and Metal Men Part

For the afternoon session the meeting split, the coal operators assembling in another room and discussing the general business situation. Carl Sholz, of Chicago, Ill., occupied the chair. From all reports there was not so much harmony as good fellowship.

In the ballroom, W. H. Fluker, of Thomson, Ga., read an address on gold mining in that state. Dr. Martin M. Foster, chairman of the House Committee on Mines and Mining, read an article on 'The Federal Government and the Mining Industry." Prof. C. J. Norwood called attention to the need for federal aid of mining schools, comparable to the assistance now given to farming institutions. He said that the strength of the Kentucky coals to resist compression had not been determined and that when recommending as chief inspector an increase in size of ribs, he was unable to determine what that increase should be owing to lack of funds for the necessary experiments.

"The Radium Situation," by C. W. Parsons, of the Bureau of Mines, was extremely interesting, that organization being about to prepare radium for use in American hospitals. Most of the radium ores are found here, but only about one gram of the metal is to be found in America in its available form and all of that was extracted abroad.

In the evening a smoker and vaudeville which was largely attended was held in the ballroom of the hotel.

Friday was the closing day of the meeting and in the morning session, Geo. R. Wood reported for the Committee on Standardization of Electric Equipment in Mines.

Compulsory Arbitration and Collective Bargaining

Wm. B. Wilson, Secretary of the Department of Labor, then delivered an excellent address on "Arbitration as a Factor in the Mining Industry," in which he opposed compulsory arbitration, but said that there were moral, business and political reasons for collective bargaining. Without it, the working man was crowded to the wall, without it business men did not know at any time what labor disturbances might confront them, what reduction in wage scale might occur to aid a competitor, what increase of wage rates might make it impossible to produce coal at contract rates.

He believed that when the working man was forced by law into compulsory arbitration, he would be at a disadvantage for while the operator had a well-defined boundary line between profitable operation and economic loss, the worker had a flexible line of resistance. He could reduce or decrease his living charges. Thus the

Carl Scholz
Newly elected president of the American Mining Congress.

arbitrator tended to keep in mind the defined boundary line of prices and to put the burden on the workingman, who by surrendering his standard of living, could continue to subsist.

C. E. Maurer tried to discover on what basis Mr. Wilson figured a division between the "partners in industry" —capital and labor. Finally Mr. Wilson declared it was an "American living wage" but he admitted that the expression was extremely elastic and meant one thing in Illinois and another in West Virginia.

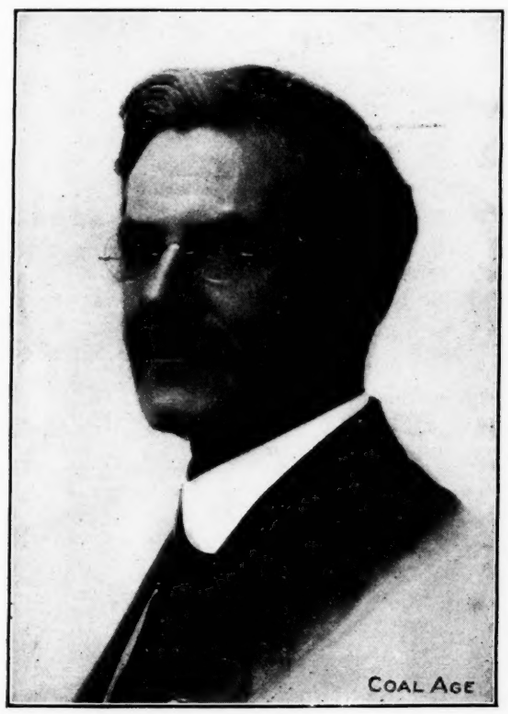
Should the Miner Be Held to his Bargain?

Mr. Wilson declared that it was not right to hold the miner rigidly to his bargain and to compel him by law to work at the scale he had signed because the operator could not be bound to keep his pledge, for he could not be compelled to operate at a loss or to run his mines when no coal was needed. Both parties, in his opinion,

broke their bargains to some extent by suspending operation, and usually without moral stigma. The contract could only be interpreted to mean that when A and B chose to work in partnership, the terms should be as A and B had laid them down. Any attempt to make the unions responsible by forced incorporation, he regarded as ill advised. W. L. Connell, of Scranton, said that the anthracite miner could move to the bituminous region if he did not like the contract but the operator of an anthracite mine could not thus move from place to place. Mr. Connell condemned the continued restriction in output which was, in the anthracite region, a fixed policy of the Union.

The Resolutions of the Congress

At the afternoon session several resolutions were introduced by S. A. Taylor on behalf of the committee appointed for that purpose. Sidney Norman's resolution placed the congress on record as favoring laws to give



J. F. Callbreath
Secretary of American Mining Congress.

protection to minority stockholders by making directors more definitely responsible for their welfare and constituting infraction of laws to that end as a felony punishable by imprisonment. The resolution calls attention to recent Stock Exchange scandals in New York.

D. W. Brunton's resolution called for an attempt on the part of the mineral land-law revision committee of the congress to enlist the support of the American Institute of Mining Engineers and the Mining and Metallurgical Society. Another resolution introduced by D. W. Brunton urges upon President and Congress the enactment of legislation providing for a Department of Mines and Mining with a member of the President's cabinet at its head.

S. A. Taylor himself fathered the resolution that the Director of the Geological Survey and the Director of the Bureau of Mines be requested to coöperate with the heads of the departments of mines or the proper officers in the various states, together with a committee of the American Mining Congress in order to secure uniformity as to form and time of making mining statistical reports.

H. N. Lawrie's resolution urged immediate passage by Congress of legislation, providing for federal assistance to state mining schools. C. E. Maurer, of Ohio, declared in his resolution that as there were many systems of evaluating properties and as a tendency had been shown to put an undue load of taxation on the mining industry and as this burden was far from uniform, hence a special committee of the congress should be appointed to investigate and recommend a fair, uniform and equitable basis of valuation for taxation.

William Maloney presented a resolution, desiring that the federal government speedily enact laws granting redress to Alaska, so that private capital may be induced to interest itself in the development of the great natural resources. John E. Patton, of Tennessee, desired that the U. S. Internal Revenue collectors have instructions issued to them by the treasury, so that the Corporation Income Tax Law may be made uniform in its enforcement and may provide that a definite royalty or depletion charge be allowed as an item of the cost of production in arriving at the net income of mining companies for purposes of taxation. R. Dawson Hall introduced the following:

> Resolved: That we express our sympathy with the relatives and friends of those who have lost their lives in the terrible explosion at the Dawson mine and that we join with the officials and owners of the Stag Cañon Coal Co., in regretting that all their efforts and forethought have, in some unfortunate and inexplicable manner, been rendered of no avail and that the secretary communicate the matter of this resolution to the proper persons.

C. E. Maurer's resolution was passed urging upon the Congress of the United States and the State legislatures, the necessity of a modification of the so-called "Anti-Trust" laws as applied to our natural resources in order that they may be conserved and proper safeguards thrown around the employees and further providing that the address of E. W. Parker be sent to the President and Federal Congress and the governors of the coal-producing states. All the resolutions here discussed were unanimously approved.

In the afternoon an address on "Workmen's Compansation Laws and Accident Prevention Work," was read by David Ross, of Springfield, Ill. Lack of time caused S. A. Taylor to ask privilege to print his paper without reading it. In the absence of Dr. J. A. Holmes, director of the Bureau of Mines, Geo. S. Rice, read his "Lessons of the Year in the Mining Industry." In brief it deplores the "tardy and inadequate recognition and aid from the legislature and administrative branches of the general government" and stated that the bureau had been criticised for "failure to do numerous things of which there was serious need." "It is unfortunate, however, that our inability to do many of these things at the opportune time tends to discredit all our work and even the movement for greater safety among the miners, who appreciate less fully the cost of such investigations and whose goodwill, confidence, and coöperation are essential to the success of all our efforts."

Carl Scholz, who was elected president, occupied the chair throughout the afternoon session. The resolutions introduced by J. R. Burton, of New York, providing for the investigation of scandals by a committee of the congress and for the expulsion of members of the body who employed men who had been convicted of fraudulent mineral land selling, were tabled after no little discussion and debate.

The first resolution would have involved the Congress in bankruptcy and the second meant the establishment of a blacklist and was of doubtful legality.

The officers for the ensuing year are: Carl Scholz, president; Hennen Jennings, Washington, D. C., first vice-president; M. S. Kemmerer, New York, second vice-president; Harry L. Day, Idaho, third vice-president; with the following directors, D. B. Brunton, Colorado; D. H. Dern, Utah; W. G. Conrad, Montana; S. A. Taylor, Pennsylvania; John Mayer, Missouri; H. N. Taylor, Illinois; E. A. Montgomery, California; W. J. Richards, Pennsylvania and Dr. James Douglas, New York.

In the basement of the Horticultural Building, a "coal mine" had been prepared by the Bureau of Mines which gave the public a good idea of underground conditions. Rescue and first-aid demonstrations were made by the Lehigh Valley Coal Co., on Oct. 20; by the Susquehanna Coal Co., on Oct. 21; by the Lehigh Valley Coal Co., on Oct. 22; by the Lehigh & Wilkes-Barre Coal Co., in the evening of the same day, and in the afternoon of Oct. 23; by the Lehigh Coal & Navigation Co., on the evening of Oct. 23, and in the afternoon of Oct. 24. The Philadelphia & Reading Coal & Iron Co., demonstrated on the evening of Oct. 24, and both morning and evening of Oct. 25.

In the lecture hall lectures were given by J. R. Fleming, demonstrations of rescue apparatus and first-aid work by W. L. German and O. I. Young. Motion pictures were exhibited by J. R. Fleming six times every day. The features were supplied by the Bureau of Mines.

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Explosion at Stag Canon Fuel Co.'s Mine

SYNOPSIS—At the Dawson Mines of the Stag Cañon Fuel Co., in Colfax County, New Mexico, a severe explosion probably killed 261 men. All but 80 of these have been brought out. In all, 27 men were rescued. The explosion occurred at 3 p.m. on Oct. 22. The shooting in the mine was effected by electricity, no shots being fired till all the men were out of the mine.

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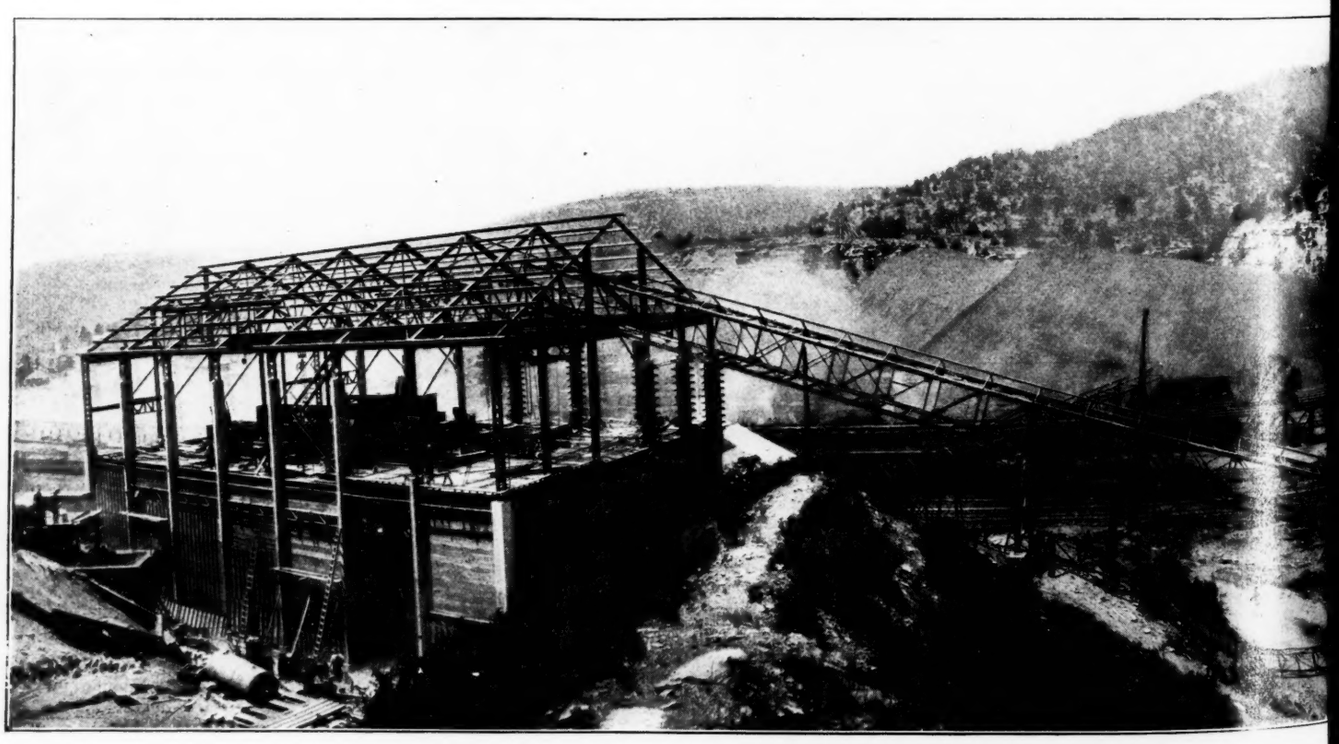
The mines of the Stag Cañon Fuel Co. are opened in Colfax County, near the northern or Colorado line of New Mexico, and, consequently, are not far from the well known workings of Trinidad and Walsenburg in Las Animas County, Colorado. The plant is located at Dawson on the Vermejo River and its branches, that watershed being an important tributary of the Red or Canadian River.

The coal mined is part of the southern end of the Raton coal field and is of the Laramie series of the Cretaceous system, these measures having a thickness of about 800 ft. in the vicinity of Dawson. According to Jo. E. Sheridan,* formerly the territorial inspector, the coal makes an excellent coke, and there are several sheets and sills of igneous rock intruded into the measures, these thickening in cases into masses like laccoliths and

*Much use is made in this report of Mr. Sheridan's address before the American Institute of Mining Engineers, in February, 1909.—Ed.



A General View of the Washery and Tipples of the Stag Canon Fuel Co.'s Mines

sometimes producing small areas of natural coke. Yet, there are few dikes throughout the entire southern portion of the field and little or no faulting occurs where these appear.

Only one seam of coal is worked, the Raton or Blossburg, and it varies from 6 to 8 and in places reaches 11 ft. The other seams are of much less value. The holdings of the company aggregate 56,218 acres, and of this 38,500 are coal lands. The mines have been working for 18 years, but they were only purchased by the Stag Cañon Fuel Co. in 1905; at that time they belonged to the El Paso & Northeastern Company.

Several Escapeways

The Vermejo River and its tributaries cut heavily into the seam, and as the coal bed is comparatively level it can be attacked anywhere along a crop 40 miles in length. Consequently, it was hoped, that with so many opportunities for escape after the recent explosion, several men might be saved. The bulk of the workings are to be found in Rail Cañon, where are the washer, power plant and coke ovens. In this cañon are four important openings, but Nos. 2 and 3 do not constitute entirely separate mines but are connected by many headings. On the Vermejo River bank, not far from Lorita, two openings, Nos. 5 and 6, have been made. The former alone is working and forms an escapeway for mines 2 and 3.

The coal is hauled by mules from the rooms to partings within the mine, whence it is brought to the outside yards by Jeffrey, Westinghouse and Goodman motors. On the outside, coal is hauled from mines 1 and 2 to a common tipple over a tramway 6600 ft. long by two 28-ton Porter, one 20-ton Vulcan, one 18-ton Lima, and two 6-ton Porter steam locomotives.

The mines have been sprinkled by water cars and the dust has been removed from the roadways as far as is practicable. A complete telephone system having stations at the most convenient points within the mine, was installed to afford communication with the outside.

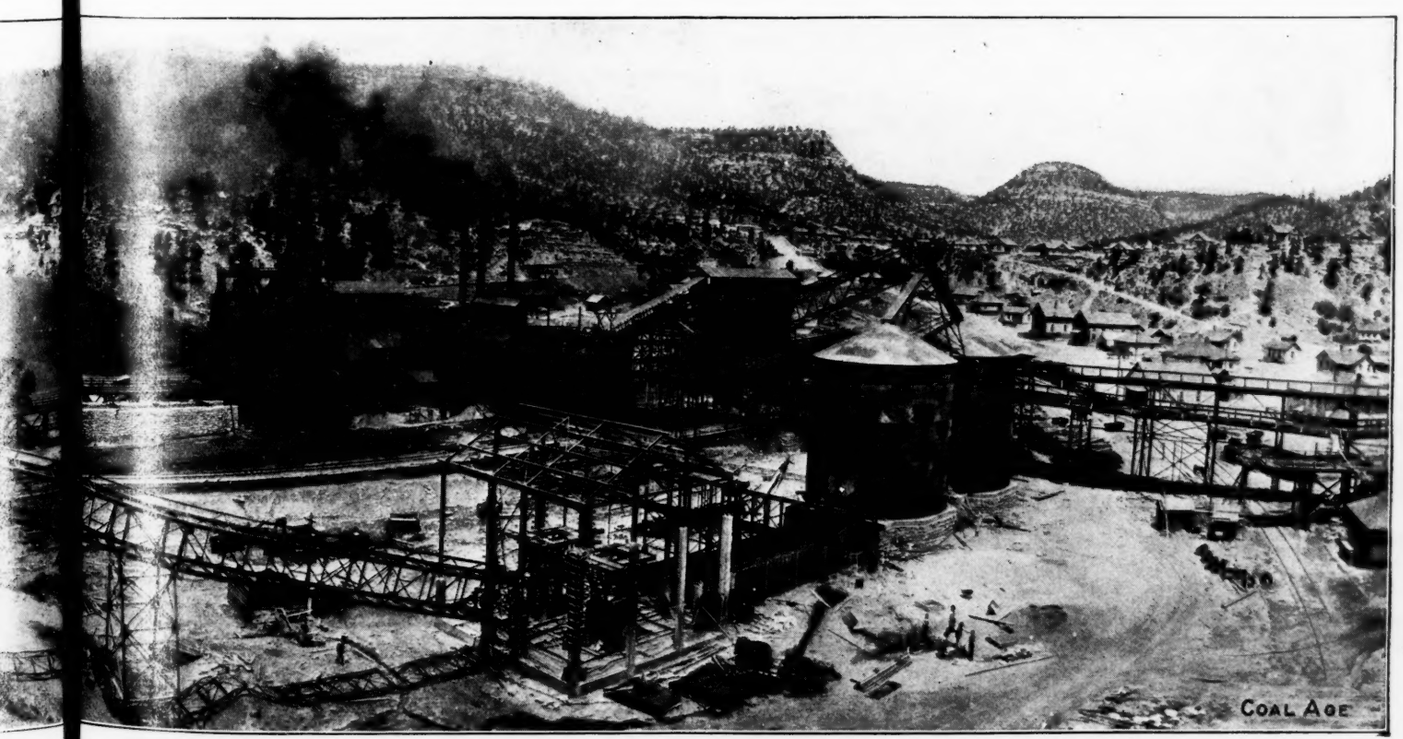
The shooting was done after all the men were out of the mines. Every man hung up his check as he went into the mine, and took it on leaving. If he failed to take his check, the mine was searched for him. The usual precautions were taken in throwing switches and a red light was displayed at the mouth of the mine to warn men from entering before the firing switch was thrown.

The air delivered to the mine was in 1909, 260,558 cu.ft. per min. Allowing 600 cu.ft. for each of the 59 mules this left an allowance of 306 cu.ft. for each man employed. The water gage at No. 4 mine was 0.8 in. and at No. 2, 1.2 in.

Information So Far Received

Despite all the care manifested by the company, at 3 p.m. on Oct. 22, there was a disastrous explosion in No. 2 mine, in which 261 men were probably killed, 27 being rescued. Heavy falls of roof near the entrance blocked the way to the rescuers. The fan was put out of commission, but was repaired and made available for the rescue work. The mine covered so large an area, 437 acres in Rail Cañon having been extracted before 1909, mostly from the mines where the explosion occurred, that it was for a long while hoped that many of the men might have wandered into remote sections of the mine and escaped. It is now feared that there is no such possibility. Apparently, Superintendent William McDermott and Henry P. McShane, of New York, and 16 miners and sub-bosses were about to escape when a fall of roof killed and covered them with débris.

It is reported that two of the helmet men were killed at their work.



AT DAWSON, N. M., DURING CONSTRUCTION. NO. 2 MINE LIES FURTHER UP THE VALLEY

EDITORIAL

Getting a Congress under Way

The American Mining Congress tried to devote one whole day to formalities and suffered the natural consequences of the attempt. An address of welcome from the city was to be followed by one from the state; the president of the congress was to respond and then three-minute replies were to be made by the delegates from 33 states. In the evening the president was to make his annual address and there was to be a reception to the officers and delegates by the citizens of Philadelphia.

Such an elaborate program of mutual gratulation does not attract anyone. The delegates and members agree to wait till, as they express it, "the convention settles down to business." They are somewhat inclined to put on the average presidential address, the unfavorable criticism of Dr. D. W. Brunton: If the outgoing president comments on the year's successes, he is thought to be guilty of self-laudation; if, on the other hand, he lays down the necessities of the hour, he is subjected to the accusation that he is trying to control by officious advice the conduct of an office which he is about to vacate.

So this function is rarely enthralling unless it is made, as we believe is true in England, rather an address from the president than a presidential address, the speaker forgetting his office and striving merely to deliver an utterance which will have an interest in itself regardless of its relation to any past or future action of the body to which he has been appointed president. He is thus often enabled to probe deeper into some subject than any earlier investigators and does not endeavor to cover all the objects of the society with a series of inadequate generalities.

Even though the address be as excellent as that of Doctor Brunton, it fails because the mind cannot be led to consider several problems at once and because all traditions are against the laying of stress on such official utterances.

Because of a knowledge that opening sessions are rarely important, the attendance of Tuesday was scanty and the citizens of Philadelphia, who, be it said, desire to correct the Universe without intimate knowledge of its affairs, were not encouraged by the scanty enthusiasm of the members and delegates. The interest of the press and of its readers flagged, whereas had Shafroth, Wilson, Parker or Moorshead spoken at the opening session, there might have been a keener interest shown.

It is to be hoped that in coming sessions the "pink tea" features will be wholly subordinated to business, that the 33 delegates-in-chief will not be called to give 99 minutes of oratory. It is still more to be desired that the meeting will be held where more coöperation is extended. The action of Philadelphia was not one to establish its reputation as a convention city. Its uncertain policy in reference to the mining show, the ruling of its papers that they would not mention the event till it was already in progress, and its almost studied indifference to what was transpiring, convince us that not for a long time will the management of the congress again exhibit on its badge and program a picture of a miner hand-in-hand with William Penn.

Eventually the congress got under way, with a large number of distinguished persons present and many papers of unusual value. It was not successful, however, in impressing on the public the broad sense of responsibility to the nation existing in the coal industry and its desire to coöperate with the public in the promotion of all the national needs. This publicity must be obtained and the public learn that its most abused servant is the one which has served it most faithfully and received the meanest reward and the most carefully studied misrepresentation and abuse. The papers of the congress and its resolutions should appear in brief in the journals of all the cities of the Union, for mining is the second largest interest in this nation.

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Colorado Coal Strike Situation

Before the recent strike in Colorado was called, the United Mine Workers of America claimed a membership in that organization, in the States of Colarado, Utah and New Mexico, of only 2048, out of a total of 23,000 men employed. Approximately 1000 of these members were enrolled from the northern part of Colorado, where a strike had been in progress for many months.

Some weeks ago an official of the Mine Workers' organization went to Colorado and announced that it was his purpose to bring about the recognition of his union by the owners of all coal mines. The operators refused to sign a contract which would require them to employ only union men in their mines.

The union official above mentioned then announced that he would refer the matter to a convention of miners of all the camps of the state. A meeting was held in Trinidad and 250 men were present. Of this number 100 men were striking miners from northern Colorado; about 45 of the delegates were officers or paid employees of the union. The rest of the men present were selected by those in charge of the convention, and in no sense actually represented the men at work in the collieries. The convention voted to call a strike for Sept. 23, and on that day approximately 50 per cent. of the men engaged in about the coal mines laid down their tools.

The demands of the miners include a 10 per cent. advance in wages, a semi-monthly payday, an eight-hour work-day, a check weighman and better working conditions.

There has never been a better example of how easily one or two men can upset a great industry and bring business over a large territory to a condition bordering on chaos and revolution. People who think that such a result can only be brought about when the conditions of labor in the affected industry are unsatisfactory and unfair will be obliged to revise their opinion, providing they will take time to make a careful investigation. There is, of course, a restless element in labor circles that is

never satisfied and always ready for a change, or any kind of an adventure, that will bring with it temporary freedom from real work. However, there are not enough such people to bring about a condition similar to the one now existing in Colorado. Something more must be supplied, and this is furnished in the form of intimidation and personal violence.

Conditions in Colorado are a replica of what occurred in West Virginia some months ago. Since the inauguration of the strike, a number of men have been killed and considerable property has been destroyed; mine buildings are being fired upon; passenger trains carrying mail have been stopped and searched by the strikers; occupants of stages have been dragged therefrom, kidnapped and taken to strike headquarters, and the lives of all men who are desirous of working in the mines are threatened daily.

Labor conditions in this country have now reached a pass where one or more professional agitators can walk into a district or state where they are unknown and unfamiliar with actual conditions and succeed in the disruption of all business in the industry they attack. This is a form of licensed violence that must be dealt with if we, as a nation, are to maintain our industrial supremacy among the governments of the world.

We are earnest in our desire that labor conditions througout the coal industry shall be satisfactory. We want to see the men who work amid the dangers of our mines the best paid employees in the land. We never have, and never expect to uphold, any coal company or any individual officer that is unfair and selfish in the treatment of his employees. However, we seriously advocate the enactment of such measures as will provide a less destructive method of settling disputes between employers and employees. A partial solution of the problem is "publicity." Newspapers, as a general rule, are like politicians, somewhat shy on supporting the minority, even though the "few" have right on their side. There remains, however, one way in which publicity may be gained, and that is through advertising. It is surprising today that so few great corporations which need to place their cause before the people at large avail themselves of the advertising pages of the papers in their particular field.

The Western Coal Lands

Of all the interesting features of the American Mining Congress, the debate between J. F. Shafroth, senator from Colorado and G. O. Smith, director of the U. S. Geological Survey, takes leading place. Mr. Smith has indirectly the selling of the patrimony of a nation and has managed after a long delay, to dispose of a solitary square mile. Yet this one insignificant sale, he regards as a justification of the prices he has set on all the coal lands he is marketing.

If the followers of Henry George ever start to make Uncle Sam pay taxes, we shall soon see whether he will find it possible to hold Western coal lands at $400 an acre. Land holding at outrageous prices has always been found unprofitable where taxes had to be paid and this nation would find itself in the hands of the sheriff, if it had to pay taxes on the coal lands of the West, if these were assessed at the extremely liberal valuation of the director of the Geological Survey.

We are not surprised that the Western states which have to maintain their schools, their roads, their police and their courts, condemn the bureaucracy which holds so large a proportion of their lands inactive and yet refuses to pay taxes on them. Perhaps it would be right, certainly it would accord with our precedents, to let lands in the hands of the government go untaxed till they can be sold, if provision for their sale were immediately made and if the price was perfectly sane. But millions of acres are withheld from entry and other millions are evaluated at a higher price than is now paid in most of the best known coal fields of the United States.

We think it may be safely said that in only one state in the Union is coal land ever sold at $400 per acre. Anthracite and the Pittsburgh coking coals of Pennsylvania are sold, it is true, at higher prices, and some West Virginia coal, if it were offered for sale, would command almost that figure, but the bulk of the coal land even in those long developed states is nowhere so highly appraised. The majority of the fuel in the Appalachian states can be bought from $5 to $100 per acre.

We are giving the West special legislation of a most onerous and unfair character. Lands which if sold by individuals would barely bring $5 or $10 per acre to the vendors, are held for $400. Let us compare the situation in the Rocky Mountain section with the conditions in Ireland, a land where the desire for the control of its own affairs is even more rampant. By the enactment of special and unusual legislation, the imperial parliament has made every effort to secure land for the inhabitants at reasonable prices and to enable them to buy what land they need. And furthermore, that parliament is already expending on Ireland within the confines of its four seas, far more than the island contributes. In fact it is likely that the dominant kingdoms of England and Scotland will pay $10,000,000 a year to Ireland and receive not one penny for national defense or administration.

In contrast we take from Colorado $15,000,000 per annum for national purposes and are holding up its resources and those of other Western states at such a high figure that their development is throttled. At present they are talking home rule or states' rights in a mild way. They are aiding in the support of our national institutions, though most of these do not add in any material way to their happiness or security. Our army and navy afford little protection and our rivers and harbors bring little wealth to Colorado compared with that they assure the other states. Yet the Western people now pay and are willing to pay *pro rata* taxes with states more vitally interested in these institutions.

Let us be careful lest the Western states, whose interests are forgotten, become so angered at our unfair treatment that when they get justice, perhaps even more than justice, they will not be appeased. Indeed, let us make all haste to do our duty now for the concessions now rightly demanded by Alaska and the West will ultimately be granted, and the theories of Pinchot, Smith and the newspapers will fade away like an evil dream. For are we not all one people and are not the men of the West as well entitled to justice and as much our national concern as the inhabitants of Indiana, Ohio and Illinois? Is it expedient that we should demand of our citizens in the West a manner of sale radically different from that which has been our practice for a century?

SOCIOLOGICAL DEPARTMENT

Simplified Breathing Apparatus at Witkowitzer Mine

By Josef Popper*

SYNOPSIS—Details regarding a new breathing apparatus, the helmet of which is made tight to the face of the wearer by a sponge-rubber gasket. The potash cylinder has devices whereby all the alkali is made available for the absorption of carbon dioxide and the cooler is kept at a low temperature by the use of asbestos steeped in alcohol. The apparatus can be kept in continuous service from 3 to 3½ hr. and weighs 26 to 29 pounds.

Previous improvements in breathing apparatus have not been based on any new fundamental principles. They have, however, tended to increase the weight with which the rescueman is burdened. In the laboratory of the Witkowitzer collieries in Maehrish-Ostrau, Austria, experiments have been made with a view to simplification of the commonest types of rescue apparatus. The objects have chiefly been to reduce the weight for equal time capacity and to cool the inhaled air to a lower temperature so as to reduce fatigue. The total weight of the apparatus has been kept down to about 27 or 28 lb., yet the designers have been able to use a larger steel cylinder and a new type of potash cartridge, which together make possible the use of the helmet for a longer period than has been hitherto possible.

A Rubber Sponge Instead of an Air Tube as Face Gasket

An improvement has also been made in packing the helmet so as to avoid the danger inherent in those packed with a rubber tube, should this tube become damaged. This pneumatic ring has been replaced by a rubber sponge, over the outside of which is drawn a sheet of rubber. But the side of this gasket which is in contact with the face is not so protected, and is left in a spongy condition. In hot mines it can be cooled by moistening. The sponge is pressed down by two bands. The helmet carries a window glass and a movable wiper.

The apparatus is carried on the back. The oxygen flask *O* weighs 11 lb. It holds 13.77 cu.ft. of oxygen at a pressure of 150 atmospheres. The pressure can be read by the man wearing the helmet from a manometer placed on a spiral tube. The reducing valve is so adjusted as to feed about 0.07 cu.ft. of oxygen per minute.

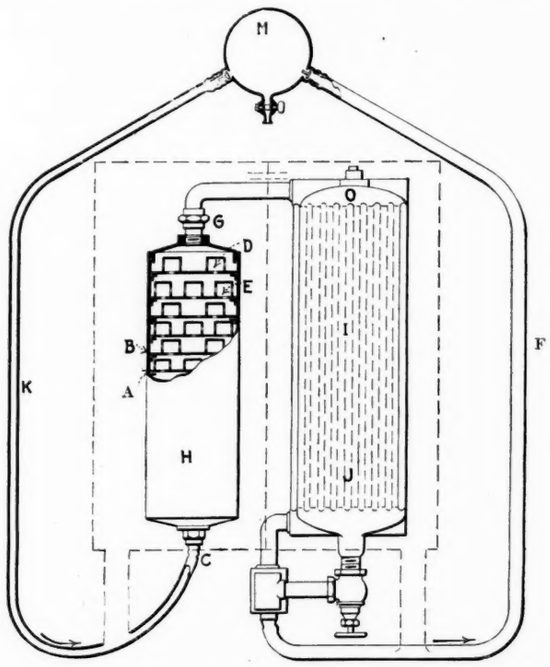
The fresh and the regenerated exhaust pass through the connecting tube *F* into a breathing bag of large size and thence to the mask *M*. The cartridge is fastened in place by a simple device, it being held and made gastight by the adjustable threaded tube *G*. The cartridge is of a new type patented by Nowicki, chief chemist of the collieries.

*Engineer, chief mining inspector of the Witkowitzer collieries in Maehrish-Ostrau, Austria.

Note—From a paper before the International Congress of Rescue Work and Accident Prevention, Vienna, 1913. Translated expressly for "Coal Age" by E. F. Buffet, from the "Montanistische Rundschau."

The Air Regenerator

The chemicals for purifying the exhaled air are held as usual in sheet-metal shelves with central or side openings, and by wire netting. Between the several shelves the air sweeps over the chemicals. To place these under the wire netting and simply pass air over them is an inefficient practice, for the chemicals are not completely utilized and take up gases only on their surface. This leads to



A Breathing Apparatus Now Being Subjected to Experiment

the use of more alkali than is necessary, and thus adds to the weight of the cartridge.

In the new potash cylinders the chemicals are still used in granular form. The grains of caustic potash are placed on the shelves *A* and *B*, which have a series of holes covered with the little perforated spacing caps *D*. The holes *E* in one shelf are staggered with respect to those in the next. The side walls of the spacing caps let the gases pass easily through. The gas to be treated by the chemicals enters from below through the tube coupling *C*, and passes up through a large number of holes *E* and through the spacing caps, which are fastened on the lower shelves. Hence it reaches the chemical between the spacing caps. In contrast with the common type of cartridge, the air does not pass by or over the chemicals, but owing to the cap device is compelled to penetrate to the interior of the chemical layer.

Shreds of filter paper are mixed with the chemical to take up such potash as is dissolved by the moisture in the expired air. Experiments show that after two hours the regenerated air contains no carbon dioxide, after three hours 0.2 per cent. of its volume and after four hours

only 0.6 per cent. In the experiments, cartridges of 2.2 to 4.4 lb. weight have been employed. The exhaled air passes into the cartridge *A*, where its carbon dioxide is removed. Thence it flows through a tubular cooler *I*, which, to increase its cooling effect, is provided on the lower part with asbestos *J* which, previous to using the apparatus, has been saturated with a volatile liquid (alcohol). From the cooler the air passes to the injector and then to the helmet.

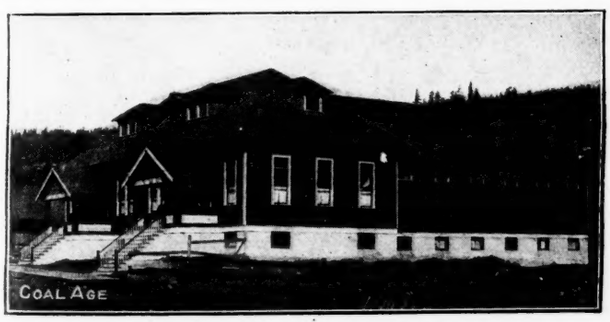
From the helmet the exhaled air is first conducted by the action of the injector through a breathing tube *K*, into the exhalation half of a double bag. This half is connected with the inhalation section by a little tube.† Both the inhalation and the exhalation halves are made in one, and divided in two parts by a separating wall. One part is placed under the steel flask, the other under the cartridge. The weight of the apparatus is between 26 and 29 lb. for a duration of three to three and a half hours.

The experiments have not been completed, but they indicate that a distinct advance has been made in breathing apparatus.

Welfare Work at Roslyn, Wash.

By Ralph W. Meyer*

Roslyn's new $10,000 Y. M. C. A. building was formally opened to the public on Oct. 7, the anniversary of the destruction of the old structure by fire. The Northwestern Improvement Co. contributed $4000 on condition that an equal amount be raised by the miners and citizens of the town. Over 700 persons responded and oversubscribed the amount, and the result was the construction of the only Y. M. C. A. to be found in a mining camp in the Northwest. The company not only contributes the sum stated but also gives the site for the building, provides free lights and coal, supplies steam for the baths without



Y. M. C. A. Hall Erected by the Northwestern Improvement Co. and Its Employees

charge and pays the secretary's salary. Taking the old institution as a criterion, the building forms the best investment the company has in the town.

Description in Detail

The basement contains the heating plant, a large swimming pool, shower baths, clothes lockers and a drying room. In this respect it is unique, being the only Y. M. C. A. west of the Rockies which has a miners' bath and change room. This department is well patronized by the miners.

A bowling alley is partitioned off from the swimming and bathing part of the lower floor. The main floor contains a large auditorium with a gallery around it and a stage at the end. It has capacity to seat about 700 persons, and Chautauqua lectures and other entertainments will be held in it. The chairs can be folded and moved out of the way when it is desired to use the place for a gymnasium or for basketball games. The main floor contains a large room for the circulating library, a reading room, a billiard and pool room, a ladies' rest room, and a large room for the secretary's office.

Other large mining companies in the Northwest are watching it with interest. If it is an undoubted success, they expect to start organizations of a similar nature in their villages. During the winter season, a teacher gives instruction in English to a large class of foreign-born miners, in one of the small rooms of the building.

Mine Rescue Maneuvers

The Bureau of Mines from its experience of the turmoil of impromptu rescue work, its uncertain discipline and later vain regrets, has decided that success in actual mine recovery can only come by duplicating the difficulties and conditions, commonly to be faced, at maneuvers carried out in an actual mine.

To this end a few days before the American Mine Safety meeting about 20 members of the Bureau of Mines, camped at Oak Station, near Pittsburgh, Penn., on the Charleroi branch of the Pittsburgh Railways Co., for 10 to 12 days for practice in rescue work. As soldiers and sailors should not wait for actual war, so rescue corps should have actual practice in the conduct of rescue work apart from mere helmet-wearing exercises.

Training in musketry should be supplemented by maneuvers if soldiers are to be prepared for war, and realizing the force of the analogy, the Bureau of Mines is endeavoring to develop the study of mine-rescue work apart from mere helmet practice.

The study of recovery of mines after mine explosions and fires, started by W. E. Garforth and extended by the American Mine Safety Association, is now to be made more vital by actual mine-rescue "field work" in real mine workings.

It is a poor time for planning when the thought of others dying makes concentration of mind difficult or impossible, when the peculiar immediate problems relating to the mine complicate matters and when danger threatens on every side. If the general principles have been thought out at a time when there is no mental or moral stress, the mind can meet these problems of the minute without confusion.

The difficulty of conjuring up conditions without enacting them resembles that of designing a machine without a sketch on paper. A few general ideas may be evolved by mere thought, but a mass of thronging details are made manifest by practice. Paper will refuse nothing but the test of field maneuvers can never be so deceptive.

For a purpose of this kind a small experimental mine is relatively of little value. What is needed are workings large enough to duplicate conditions likely to be met in actual rescue practice. The burden of carrying the apparatus long distances will prepare the crews for the severities of real mine recovery.

*Roslyn, Wash.

†Apparently this is used when the potash cartridge is replaced.—Ed.

DISCUSSION BY READERS

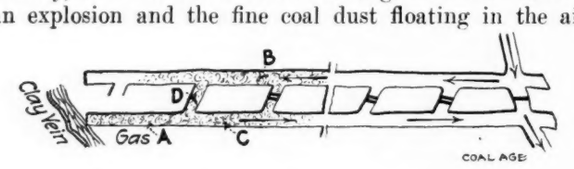
Collapsible Stoppings

Letter No. 7—Before discussing the question of the possible efficacy of "collapsible stoppings" in mines, it will be well to understand two points bearing on the subject. 1. What constitutes a collapsible stopping? 2. What features of an explosion will such a stopping affect?

A collapsible stopping may be understood to be one constructed to withstand the ordinary concussions incident to mining coal, but not permanent under the excessive stress of even a comparatively slight explosion of gas or dust. Such a stopping may be constructed (a) to conduct the ventilating current with a comparatively slight loss of air, to the working face or head of the entry; or (b) it may be built in such a manner as to allow a large percentage of loss where the working requirements will permit of such loss.

The stopping first mentioned, being comparatively tight and allowing but a small loss of air, will naturally make the void spaces in the breakthroughs reservoirs for the deposition of much dust, which will be drawn into these places and settle because of the reduced velocity of the air sifting through the stopping. The second stopping mentioned, having larger openings and permitting a greater loss of air, will not accumulate as much dust as the former. When we consider that coal dust is an important element in the propagation of an explosion, if not the chief element concerned, the danger presented in the use of either of these stoppings, as accumulating quantities of dust and distributing the same in the airways in the event of any concussion of the air, is clearly apparent.

The principal feature of an explosion that the collapsible stopping is expected to affect is the rapid expansion of the products of combustion. There are two incidental characteristics, besides, that should be considered; namely, the unburned combustible gas in the wake of an explosion and the fine coal dust floating in the air.



ILLUSTRATING AN EXPLOSION OF GAS

It will be interesting, in this connection, to consider an explosion of gas as occurring at the face of the return heading, at *A*, in the accompanying figure. The gases produced by the explosion at *A* expand a certain distance down the return heading *C* and, at the same time, are driven through the open crosscut *D*, and outby along the intake airway *B*. If the stoppings on these headings are substantially built, the pressure due to the expanding gases being nearly equal on both sides, it may be assumed that these stoppings will not be thrown down. In that case, the expansion along the return airway *C* will be limited by the force of the initial blast and will die out for lack of air to support the flame. The expansion along the intake airway *B* will probably extend a greater distance, owing to the combustion being fed by the fresh intake air. Much will depend, of course, on the amount of fuel (gas and dust) fed to the flame in its progress along the entry.

Now, consider for a moment what would be the probable effect if these entry stoppings were collapsible. It seems clear that the throwing down of the stoppings in the crosscuts would result in blowing a large quantity of dust into the air, and this dust would feed the flame and add to the force and violence of the explosion. Moreover, the destruction of the stoppings would allow the fresh intake air to feed the explosion on the return airway, and both of these entries would then furnish a path for the explosive wave.

Although the suggested reasoning, in reference to collapsible stoppings, is based upon admissible data, the conclusions reached are not of general application in coal-mining practice. The existing facts and conditions will generally make a vital difference in the results. There is room for much practical experimentation, before the question can be satisfactorily solved in its different phases.

I. C. PARFITT.

Jerome, Penn.

Mixed Lights in Mining

Letter No. 19—If not too late, I want to express my opinion on the use of mixed lights in coal mining, recently discussed in COAL AGE, Oct. 11, p. 553. I consider it a pernicious practice to allow the use of open lights in any portion of a mine generating explosive gas in such quantities as to require the use of safety lamps at the working face. The number of accidents that have occurred and lives that have been sacrificed on the altar of mixed lights are legion.

To illustrate the danger of this practice, I will relate, briefly, one or two incidents that have occurred in my experience. A number of years ago, Chinamen were employed at the Union mine, in British Columbia. They were allowed to work underground and were probably no more an element of danger than the class of foreigners employed today, who cannot speak English. It was the custom, in that mine, to use naked lights on the levels and main air courses, while safety lamps were required in the pillar districts. A Chinaman was tramming on one of the levels. A number of boxes (cars) were off the track and to get some help to replace them, the Chinaman went into the pillar district with his open light. The result was an explosion that killed 21 men.

At Coleman, Alberta, several years ago, an explosion occurred resulting in the death of three men. This accident, also, was the result of using mixed lights in a mine generating gas. In this mine, each miner was provided with a safety lamp for the purpose of examining

his place before commencing work, or after firing a shot, or on returning to his place after a short absence. It so happened that an old experienced miner neglected examining his place with the safety lamp, and entered with an open light on his head. As a result, a body of gas was ignited and the explosion that followed caused his death and that of two others.

Neither of these explosions would have occurred had safety lamps been used exclusively throughout these mines. The temptation to use naked lights in a mine whenever these are available is strong, not only among the miners but among mine officials as well. The list of those who have been caught taking this chance includes even mine inspectors. It seems more natural for many mining men to assume that no gas is present rather than to assume that gas may be present.

Such is the history of mixed lights in coal mining in the past, and it will probably repeat itself in the future, as long as the practice is continued.

The only remedy is to eliminate the cause. When it is necessary to use safety lamps at the working face, or in any district of a mine, the entire mine should be worked on safety lamps exclusively. It is common to see walking the streets, in districts where the mixed-light system is practiced, men who are or should be living, animated danger signals, warning all against such practice, by their parched glossy faces and shriveled hands and ears. On the other hand, a sense of security is experienced by most officials and intelligent miners where the practice of mixed lights is not known.

In conclusion, I want to state that a law should be put on the statute books of every coal-mining state, making it compulsory to use safety lamps exclusively where these are required in any portion of a mine. Such a law might seem to impose a hardship on the mining of coal; but, in general, it will prove a blessing in the end, by the lives saved.

J. W. POWELL.

Windham, Mont.

The Safety Lamp and the Eyesight

I cannot agree with John Rose, COAL AGE, Sept. 27, p. 465, when he says that the safety lamp has no ill effect on the eyesight of the miner. My observation and personal experience compel me to a contrary belief. In every safety-lamp district in which I have worked or visited, I have observed that the eyesight of the miners has been impaired.

Mr. Rose claims that his use of the safety lamp, as fireboss and mine foreman, produced no ill-effects. I could say the same thing for myself, having worked for several years in the Hamilton district, Scotland, where safety lamps are used almost exclusively. In that district, however, the majority of the *miners* suffer from defective eyesight, while it is rare that the firebosses, drivers and other shiftmen are affected. I know many firebosses, personally, who have used the safety lamp for 20 years and more, and still retain good eyesight. On the other hand, I can recall very few miners whose eyesight remains unimpaired after using the safety lamp, at the coal face, for a much shorter period.

The verdict of eminent medical men, who have given much time to the study of this particular disease—for it is a disease among miners—is that the feeble light afforded by the safety lamp produces a heavy strain on the eyes. They claim that this is much intensified when the man is in a horizontal position, as when mining or undercutting the coal, or when stooping in shoveling. Again, it is well known that severe physical strain has a bad effect on the eyesight; and no one can deny the fact that the miner's occupation is one that produces such strain. Add this to the ill-effects of the feeble light, and it is not difficult to understand why the eyesight of miners is impaired.

Anyone who has lived in a safety-lamp district cannot have failed to have observed the defective eyesight of many of the miners. It is particularly noticeable when the lamps are lit on the street, at night. At such a time, the miner whose eyesight is affected can invariably be observed with his head thrown back and his eyelids drawn close, as though he were looking at something intently. The effect produced on the eyesight by the safety lamp is gradual. In the first stages of the disease, a light seen at a little distance appears for a while to be rotating in a circle, but becomes stationary after a short time. Later, as the disease progresses, the rotation is more or less permanent, and the miner is compelled to stop work. The difficulty seems to be wholly confined to or, at least, greatly aggravated by artificial light. Men who are badly affected and can hardly be trusted to cross the street alone, at night, can often read without the assistance of glasses, in daylight.

In my opinion, the fact that a large percentage of claims paid under the Miners' Compensation Act, in Great Britain, is for this disease, which is known as "miners' nystagmus," proves the bad effect of the safety lamp on the eyesight of miners. I do not remember of ever hearing of a case of nystagmus in naked-light districts. According to medical men, the only cure for the disease is absolute rest for a few weeks or months, according to the severity of the case. The miner must then seek employment on the surface, and away from artificial light. I hope that the attention drawn to the matter by this discussion will warn miners who are using the safety lamp, of the danger to which they are exposed.

JAMES DICKSON.

Nanaimo, B. C., Canada.

Another Letter

The question of the continuous use of the safety lamp affecting the eyesight, which grew out of the discussion of Mixed Lights in Mining, has proved an interesting one. It seems to me, however, that one important particular has been entirely disregarded. Personal experience has been offered, as more or less conclusive proof of the statements submitted. While such experience is often satisfactory to the person, it should not be offered or accepted as indisputable evidence, but an *opinion* based on experience.

Because a certain effect is not produced on one man or individual, he has no right to conclude that such effect will *not* result in the case of another man or individual. Such reasoning would be logical, were we all constituted alike; but the fact that we are not so constituted makes such reasoning illogical.

I have worked a number of years with a safety lamp exclusively, and can conscientiously say that, so far as I can perceive, no ill effect upon the eye has been produced.

However, an oculist might detect that such effect had been produced. We know that the eye, in conformity with the general structure of the body, is designed to adapt itself to varying degrees of light; and this requirement may produce an undue strain on a particular eye, that may injure the organ temporarily or permanently.

Before expressing a hasty opinion, let anyone who claims that the safety lamp is not injurious to the eyes, recall the sensations they have experienced in passing from the gloom of the mine, where the pupil of the eye is dilated to meet the requirements of the feeble light, into the scintillating brilliancy of a bright winter day, when the sunbeams glancing on the crust of the snow compel one to close the eyes to protect them from the glare. A similar effect, to a less degree, is experienced on passing from the glare of such a day into the subdued light of a room or into the darkness of the mine. Then, consider that the eyes of a large number of people may be unable to withstand the strain attending such a sudden transition from darkness to a glare of light or *vice versa*. I feel certain that such ones will be ready, then, to admit that personal experience, in this particular, is not of general application.

I. C. PARFITT.

Jerome, Penn.

The Mine Air Current and Explosions

My attention was called some time since to Robert McCune's reply, COAL AGE, Sept. 13, p. 390, to my previous article on the above subject. I do not consider it worth while to reply to his comments, as your editorial note on p. 391 points out the fact that I attempted to express, far more clearly and comprehensively than any effort on my part could possibly accomplish.

I do not think, however, that the mathematics he presents helps to establish his claim that the compressive system of ventilation as compared with the exhaustive system counteracts, to any appreciable extent, the effect of a falling barometer. He assumes a fall of barometric pressure from 30 to 29 in. This corresponds to an atmospheric pressure of $0.49 \times 144 = 70.56$ lb. per sq.ft., or a water gage of nearly 14 in. It is quite clear, therefore, that the difference between the two systems of ventilation, which he shows to be twice the ventilating pressure or, say 4 in. of water gage, would have little effect in counteracting the assumed change in atmospheric pressure, which corresponds to nearly 14 in. of gage. It is a dangerous thing to apply mathematics to mine ventilation unless the application be correctly made.

I. C. PARFITT.

Jerome, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

FACTORING

The smaller numbers are readily factored by inspection. Following are examples of such simple factoring:

Number 8; factors, 2, 4; because $2 \times 4 = 8$;
Number 24; factors, 4, 6; because $4 \times 6 = 24$; etc.

Prime Factors—It is evident that the factors given above are not, in either case, the prime factors of the number; because the factors themselves can some of them be resolved into lower factors. The numbers 4 and 6 are not prime numbers and cannot therefore be prime factors. The following are examples of prime factoring:

Number, 8; prime factors, 2, 2, 2;
Number, 24; prime factors, 2, 2, 2, 3;
Number, 30; prime factors, 2, 3, 5; etc.

Factoring Larger Numbers—Numbers that cannot be factored readily by inspection must be factored by a process of continued division of the number by any exact divisor of the number and, finally, reducing each divisor to its prime factors, which are then the prime factors of the given number.

Exact Simple Divisors—A number is exactly **divisible by 2** when its last figure is a cipher or an even number; in other words, 2 is an exact divisor of any even number.

A number is exactly **divisable by 3 or 9** when the sum of its digits is divisible by 3 or 9; or, as we say, is a multiple of 3 or 9, respectively. Thus, 27 is exactly divisible by both 3 and 9; because $2 + 7 = 9$ which is divisible by each. Again, the following number is divisible by 3, as shown, but not by 9:

Number, 38,769,576 divisible by 3; because
$3 + 8 + 7 + 6 + 9 + 5 + 7 + 6 = 51$; and $5 + 1 = 6$

As above, the number may be so large that the sum of its digits may not be recognized, at once, as a multiple of 3, in which case, the digits of that sum may be added and this process repeated, if necessary, till the resulting sum is readily recognized as a multiple of 3 or otherwise.

The operation may be much shortened, however, by omitting to add any digit as 3 or a multiple of 3. For example, in the number above, adding all the digits except the multiples 3, 6, 9, gives:

$8 + 7 + 5 + 7 = 27$; and $2 + 7 = 9$

If desired the operation may be further shortened by throwing out all multiples of 3 from each digit and only adding the excess in each case. Thus, in the above, instead of adding the digits 8, 7, 5, 7, we add

$2 + 1 + 2 + 1 = 6$,

which is the shortest and simplest of all the methods.

A number is exactly **divisible by 4** when its last two digits are so divisible; because the figures preceding the last two are a multiple of 100, which is a multiple of 4 and can therefore be cast out. Thus, 124, 332, 504, etc., are each divisible by 4; because 24, 32, 4, etc., are each multiples of 4.

A number is **divisible by 5** when its last figure is a cipher or a 5; as for example 105, 130, 375, etc.

The Coal Age Pocket Book

Reduction of Simple Fractions—To reduce a simple fraction to its lowest terms, one of the three following methods may be employed:

(a) Divide both terms of the fraction by all the factors common to both; thus,

$$2 \left| \frac{32}{120}; \quad 2 \right| \frac{16}{60}; \quad 2 \left| \frac{8}{30} = \frac{4}{15} \right.$$

(b) Divide, at once, by the **greatest common divisor** of both terms of the fraction, which is the product of all the common factors and will be explained later; thus,

$$8 \left| \frac{32}{120} = \frac{4}{15} \right.$$

(c) The method by **cancelation** is to first resolve each term of the fraction into its prime factors and, then, to cast out those common to both numerator and denominator. The product of the factors remaining in each term will form the terms of the reduced fraction. Thus, reducing both terms of the fraction to their prime factors and canceling the same number of common factors in each term gives the following:

$$\frac{32}{120} = \frac{2 \times 2 \times 2 \times 2}{2 \times 2 \times 2 \times 3 \times 5} = \frac{4}{15}$$

To Reduce a Mixed Number to an improper fraction, multiply the whole number by the denominator of the fraction and to the product add the numerator. Write the sum over the denominator for the improper fraction required. Thus, reduce 3⅝ to an improper fraction:

$$3 \times 8 + 5 = 29; \quad \frac{29}{8}$$

To Reduce an Improper Fraction to a mixed number, divide the numerator of the fraction by its denominator; the quotient will be the whole number following which write the remainder over the denominator. The result is the mixed number required. Thus, reduce 29/8 to a mixed number:

$$29 \div 8 = 3\tfrac{5}{8}$$

To Reduce a Complex Fraction to a simple one, multiply both the numerator and the denominator, in turn, by the denominator of each mixed number in the terms of the fraction.

Examples—

Reduce $\frac{2\frac{3}{4}}{6}$; thus, $\quad \frac{4 \times 2\frac{3}{4}}{4 \times 6} = \frac{11}{24}$

Reduce $\frac{8}{2\frac{1}{2}}$; thus, $\quad \frac{2 \times 8}{2 \times 2\frac{1}{2}} = \frac{16}{5} = 3\frac{1}{5}$

Reduce $\frac{4\frac{1}{2}}{1\frac{3}{4}}$; thus, $\quad \frac{8 \times 4\frac{1}{2} \times 3}{3 \times 1\frac{3}{4} \times 8} = \frac{111}{40} = 2\frac{31}{40}$

To Reduce a Compound Fraction to a simple one it is necessary to perform the several operations indicated by the signs in the numerator and denominator of the fraction, as explained later in Addition, Subtraction, Multiplication and Division of Fractions.

INQUIRIES OF GENERAL INTEREST

The Mine Foreman's Certificate

I want to ask for a little information in regard to the mine foreman's certificate required by law and for which one must pass an examination. Is the certificate granted by an examining board in one state good only in that state, or can it be used in any other state where a certificate is required?

Also, can a mine foreman hold that position in a state where certificates are granted, if he has not obtained his certificate? As this is being done in some instances, at the present time, it would seem unnecessary to study and pass an examination to secure a certificate.

A MINE FOREMAN.

Scranton, Penn.

The law requiring the examination and certification of mine foremen is a state law in every case. The requirements are different in different states, and these depend largely on the conditions that exist in the mines of each particular state. As the law makes the examining board responsible for the certification of mine foremen, few examining boards will accept the certificate granted by a board in another state, although that is done in some states.

❖

Expansion of Air and Gas

Following my inquiry in regard to the unit weight of air, which was answered in COAL AGE, Oct. 11, p. 555, I have been puzzled in regard to the application of Gay Lussac's law relating to the expansion of air and gas. I reasoned as follows: If, under constant pressure, air expands $^1/_{460}$ of its volume for every degree of increase in temperature, a volume of 1 cu.ft. of air or gas at absolute zero (—460° F.) would become only 2 cu.ft. at 0° F. But a volume of 460 cu.ft. at 0° F. would, by the same law reversed, be contracted to nothing, at the absolute zero of the Fahrenheit scale.

Again, using the formula given for finding the weight of 1 cu.ft. of air at any temperature t and pressure B; and assuming $B = 30$ in., and $t = -460$ deg.

$$w = \frac{1.3273 \times B}{460 + t} = \frac{1.3273 \times 30}{460 - 460} = \frac{39.819}{0} = 0$$

Now, assuming a volume of 460 cu.ft. at 0° F., a *rise* of 460 deg., in temperature, will cause this air or gas to double its volume. But, assuming a *fall* of 460 deg., in temperature, if the contraction of volume follows the same law it would seem that the volume of the air or gas at absolute zero (—460° F.) would contract to one-half its volume at 0° F.; or $\frac{1}{2} \times 460 = 230$ cu.ft. Will you kindly explain this discrepancy.

I. C. PARFITT.

Jerome, Penn.

The expansion and contraction of air and gas follow the same law, known as Gay Lussac's law, which is as follows:

For a constant pressure, the volume of air or gas expands or contracts $^1/_{460}$ of its volume at 0 deg. F., for each degree rise or fall in temperature (Fahrenheit scale).

Applying this law to the expansion and contraction, respectively, of 460 cu.ft. at 0° F., gives an increase and decrease, respectively, of 1 cu.ft. for each degree rise and fall of temperature. Thus, the increase is 460 cu.ft. for a rise of 460 deg., in temperature; and, likewise, the decrease in volume is 460 cu.ft. for a fall of 460 deg. in temperature; assuming that the law held true throughout this range of temperature.

With the improved means of obtaining very low temperatures, this law has been tested in relation to the contraction of volume in air and gas, and has been found to vary slightly as the temperature approached more nearly to the absolute zero. The contraction of volume becomes less and less as the temperature is decreased below a certain point. The accompanying diagram illustrates clearly this point. The expansion line is shown to assume a gradual curvature that may be supposed to slowly approach parallelism with the vertical line of temperatures. In the diagram, the horizontal lines drawn between the vertical and the expansion line may be taken as representing the volumes of the air or gas at the several temperatures indicated.

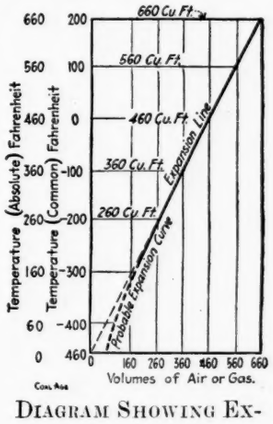

660 Cu Ft.
560 Cu Ft.
460 Cu Ft.
360 Cu Ft.
260 Cu Ft.
Expansion Line
Probable Expansion Curve
Temperature (Absolute) Fahrenheit
Temperature (Common) Fahrenheit
660 560 460 360 260 160 60 0
200 100 0 -100 -200 -300 -400 -460
0 160 260 360 460 560 660
Volumes of Air or Gas.

DIAGRAM SHOWING EXPANSION LINE FOR AIR AND GAS

The reasoning in this inquiry errs in two respects:

1. According to Gay Lussac's law, the expansion and contraction, is $^1/_{460}$ *of the volume of the air or gas at 0° F.*, which makes the increment in either case, constant. The total increase, in this case, is equal to the original volume at 0° F. (460 cu.ft.) and the volume is, therefore, doubled; but it does not follow that a like *fall* of temperature would make the volume one-half of the original volume. On the contrary, assuming the law held true, the volume would reduce to zero, the contraction being 460 cu.ft.

2. Applying the formula for finding the weight of 1 cu.ft. of air, at a given temperature and pressure, our correspondent finds that air, at a barometric pressure of 30 in. and at a temperature of absolute zero would lose its weight, which he calculates would become zero; whereas, if the law held true at such a low temperature, the weight of the air, as shown by the formula, would be infinite. A finite quantity divided by zero gives infinity. But, as we have previously explained, the law of Gay Lussac does not hold true, as the temperature approaches the absolute zero.

EXAMINATION QUESTIONS

Miscellaneous Questions

(*Answered by Request*)

Ques.—How would you proceed to examine a large anthracite colliery for the first time, for the purpose of making a report of the same to the State Department of Mines, assuming that you are wholly unacquainted with the colliery?

Ans.—Visit the mine without previous notice to the mine officials. Proceed at once to the office and examine carefully the mine map to ascertain the system of ventilation, distribution of air and the disposition of the men in the mine. Become thoroughly acquainted with the entire surface plant and its requirements; inspect the ventilating apparatus, hoisting arrangements, boiler plant; and give particular attention to the various safety devices installed and signal systems employed. Also, investigate the arrangements for the handling of supplies, such as timber, powder, hay, oil, etc. Investigate the general lighting system of the mine, the lamp house where safety lamps are used; and, if mixed lights are allowed, ascertain what precautions are adopted to prevent the occurrence of accidents common to this practice.

After a careful study of the entire surface plant and obtaining all the necessary information in reference to the mine, proceed to the bottom of the shaft and study carefully the general arrangements for the handling and hoisting of coal, tools, supplies and men. Observe carefully the manner of conducting operations at the shaft bottom; test the signal system; observe that all lights are well protected and investigate thoroughly all electrical installations. Visit all underground engine rooms, pump rooms, tool shanties, oil and lamp stations, to ascertain that the arrangements in each case are fireproof and otherwise safe. Visit the stables, observe their sanitation, with respect to drainage and ventilation; also, the method of lighting the stables.

Then proceed inby, following the general course of the air current and observing the conditions of the haulage roads, side tracks and air courses. Visit, in order, all chambers and other working places. Observe carefully the method of mining and blasting the coal, timbering the working places and note the condition of the workings with respect to gas and dust. See that every working place is thoroughly ventilated, the air being conducted to the face by brattices where necessary. See that all stoppings are properly built and of incombustible material, and that all crosscuts are of sufficient size and unobstructed. Investigate the practice of the miners in respect to the handling of powder, charging of holes and firing.

Ques.—A coal seam 6 ft. 6 in., in thickness, including 18 in. of dirt band, is standing on pillars. The rooms or stalls have been driven 14 ft. wide, and 15 per cent. of the coal has been taken out in the first working. Overlying this is a seam of coal that has been abandoned—"drowned out." The two seams are separated by 300 ft. of beds of soft shale and fireclay. State how you would proceed to extract the pillars in the lower seam without bringing the water down from above.

Ans.—The thickness and character of the intervening strata are such as to permit of drawing the pillars in the lower seam on the retreating system. The soft, shaly strata will favor the gradual subsidence of the roof, while the beds of fireclay will form a good protection against the inflow of water from above. It is important, however, that the work of drawing the pillars should be started at the inby end or boundary of the workings, and that the pillar work should be kept in line so that the subsidence of the roof will be uniform and gradual and that the strata will have no tendency to "draw." If the rooms are 14 ft. wide and 15 per cent. of the coal has been extracted, leaving 100 — 15 = 85 per cent. in the pillar, the width of the pillars is found thus:

$$15 : 85 : : 14 : x = 79.3, \text{ say } 80 \textit{ ft.}$$

The pillars should be drawn by taking a skip of, say 6 or 8 ft. off the face of the pillar, extending this the entire width of the pillar before another skip is started.

Ques.—Two drill holes are put down, one mile apart, to prospect a seam of coal. The depth of the first hole is 634 ft., that of the second, 850 ft. The surface at the first hole is 25 ft., vertical measurement, above that at the second. Find the inclination of the coal seam between the two points, measured in inches per yard.

Ans.—Add the difference in surface elevation to the depth of the second hole and from this sum subtract the depth of the first hole. Thus, 850 + 25 — 634 = 241 ft. The inclination of the seam between these two points is, therefore, 241 ft. in 5280 ft. (1 mile). Since there are 36 in. in a yard, the inclination or dip of the seam, in inches per yard, is found by the proportion:

$$5280 : 241 : : 36 : x = 1.64 \textit{ in. per yd.}$$

Ques.—With a fan of 50 hp., the water-gage stands at 1.75 in.; what quantity of air should be in circulation, if the efficiency of the fan engine is 65 per cent.?

Ans.—Taking the 65 per cent. to represent the efficiency of the fan and engine, the power on the air is

$$Qp = 0.65\ (50 \times 33{,}000) = 1{,}072{,}500 \textit{ ft.-lb. per min.}$$

The unit of ventilating pressure is $p = 5.2 \times 1.75 = 9.1$ lb. per sq.ft. The quantity of air in circulation, in this case, is, therefore,

$$Q = \frac{1{,}072{,}500}{9.1} = 117{,}850 \textit{ cu.ft. per min.}$$

Ques.—We have a tank full of water in the morning when commencing work. Using 900 hp. per hr., how long will it take to empty this tank? The tank is 10 ft. in diameter and the water 15 ft. deep.

Ans.—The weight of water in the tank is 15 $(0.7854 \times 10^2) \times 62.5 = 73{,}631.25$ lb. In the absence of exact data in regard to the style of engine, temperature of feed water, etc., it is customary to assume a consumption of 35 lb. of water, per horsepower, per hour. On this basis, the water in the tank will last

$$\frac{73{,}631.25}{900 \times 35} = 2.33 \textit{ hr.}, \text{ or } 2 \textit{ hr. } 20 \textit{ min.}$$

COAL AND COKE NEWS

Washington, D. C.

The first important step toward the application of the income tax was taken by Secretary McAdoo late on Saturday, Oct. 25, and consisted of the issuance of rules governing the application of the law and the collection of the income tax from individuals. The mechanism now in force for the collection of the corporation tax was not changed but it is understood that that is to remain practically in operation as now. The new rules applicable to individuals are however of great importance in their bearing on corporations, including those engaged in mining, because they lay upon these corporations the duty of collecting the tax at the source, by deducting from the amounts they pay to individuals the proportion which is due to the Government.

The new rules are elaborate and detailed, including a great many forms. These will be freely sent out to all corporations including mining companies which have bonds outstanding. The main part of the regulations, apart from the forms includes the following points:

Under the Income Tax Law, enacted Oct. 3, 1913, a tax of one per cent. designated in the law as the normal tax, shall be deducted at "the source," beginning Nov. 1, 1913, from all income accruing and payable to:

(a) Every citizen of the United States, whether residing at home or abroad, and to

(b) Every person residing in the United States, though not a citizen thereof, which may be derived from interest upon bonds and mortgages, or deeds of trust, or other similar obligations, including equipment trust agreements and receivers' certificates of corporations, joint stock companies or associations and insurance companies, although such interest does not amount to $3000, excepting only the interest upon the obligations of the United States or its possessions, or a state or any political subdivision thereof.

The term "debtor," as hereinafter used, shall be construed to cover all corporations, joint stock companies, or associations and insurance companies.

For the purpose of collecting this tax on all coupons and registered interest, originating, or payable, in the United States the source shall be the debtor (or its paying agent in the United States) which shall deduct the tax when same is to be withheld, and no other bank, trust company, banking firm, or individual taking coupons for collection, or otherwise, shall withhold the tax thereon; provided that all such coupons, or orders for registered interest, are accompanied by certificates of ownership signed by the owners of the bonds from which the coupons were detached. These certificates shall be in the forms prescribed and a separate certificate shall be made out by each owner of bonds for the coupons or interest orders for each separate issue of bonds or obligations of each debtor.

If, however, the coupons are not accompanied by certificates as prescribed above, the first bank, trust company, banking firm or individual or collecting agency receiving the coupons for collection or otherwise, shall deduct and withhold the tax and shall attach to such coupons its own certificate, giving the name and address of the owner of, or the persons presenting such coupons if the owner is not known, with a description of such coupons also setting forth the fact that they are withholding the tax upon them; whereupon the debtor shall not again withhold the tax on said coupons, but in lieu thereof shall deliver to the government the certificate of such bank, trust company, etc., which is withholding such tax money.

Any corporation, collecting agency, or person first receiving from the owner any interest coupons or orders for the collection of registered interest, and to whom the certificates above provided for are delivered, should require the persons tendering such coupons or orders for registered interest to satisfactorily establish their identity.

A debtor whose bonds may be registered both as to principal and interest, shall deduct the normal tax of 1 per cent. from the accruing interest on all bonds before sending out checks for said interest to registered owners or before paying such interest upon interest orders signed by the registered holders of said bonds until there shall be filed with said debtor or its fiscal agent (and not later than 30 days prior to Mar. 1) through whom said interest is customarily paid, the proper certificates claiming exemption from liability for said tax.

The debtor may appoint paying or fiscal agents to act for it in matters pertaining to the collection of this tax upon filing with the collector of internal revenue of its district a proper notice of the appointment of such agent or agents.

HARRISBURG, PENN.

The Philadelphia & Reading Ry. Co., the Philadelphia & Reading Coal & Iron Co., the Reading Co. and the Wilmington & Northern R.R. Co., principal defendants in the Governments' suit to dissolve the so called "Anthracite Coal Trust," filed separate answers in the United States District Court, recently at Philadelphia, making general denial to the charge of having formed an illegal combination to stifle competition in the sale and transportation of anthracite coal in Pennsylvania.

It is understood these answers will form the defense of all the defendants in the suit. Each answer gives a detailed denial in so far as the Government's allegations affect the individual company.

Each denies "that it is a party directly or indirectly, to any agreement, contract, combination or conspiracy, by virtue of which it, either alone or in combination with the other defendants or any of them or otherwise, has acquired the power now or hereafter to control, regulate, restrain or monopolize, or by virtue of which it, either alone or in such combination does control, regulate, restrain or monopolize, either the production of anthracite, or its transportation from the mines of Pennsylvania to market points in other states, or its price of sale, in or throughout other states."

The Reading Co. admits that it is the holding company of the Philadelphia & Reading Coal & Iron Co., and the Philadelphia & Reading Railway Co., also that it owns nearly all the capital stock of the Wilmington & Northern R.R., the Schuylkill Navigation Co., and the Central Railroad of New Jersey. It denies specifically, however, that the company was made an instrument to accomplish an unlawful purpose.

It is further averred that the plan for the reorganization in 1896 of the Railway Co. and the Coal & Iron Co., was for the purpose of saving large investments of the public and was done under the law of Pennsylvania. It is denied that the Reading Co., the Railway Co. and the Coal & Iron Co., are one and the same association of persons engaged in mining, selling and transporting coal.

The Reading Co. denies that the purchase of the majority of stock of the railroads was made to effect a monopoly, but says it was done in the natural course of business, the railroads being connecting lines.

The Philadelphia & Reading Ry. points out that substantially all the anthracite not consumed near the mines moves to market over ten railroads, that New York Harbor and Philadelphia are important markets, that Philadelphia is reached over the lines of the defendant and those of the Pennsylvania R.R.; and that a substantial tonnage is distributed by water from Philadelphia to New England.

Attention is called to the fact that during the fiscal year ending June 30, 1912, the company transported 11,224,945 gross tons of anthracite, it transported 14,806,220 tons of bituminous coal and 22,711,791 net tons of general merchandise.

The Philadelphia & Reading Coal & Iron Co. admits holding the major portion of stock of six coal companies, which own 9000 acres of coal lands in the Schuylkill Region. All was purchased in the lawful course of business, it is averred. It is admitted that, since 1896 the Reading Co. has, from time to time, made to the Coal & Iron Co. temporary commercial loans, but that these are usually repaid within a few months.

The Wilmington and Northern R.R. Co. admits that a majority of its stock is owned by the Reading Co. It denies that anthracite constitutes its principal freight, and that the acquisition of its stock by the Reading Co. had any tendency to accomplish an anthracite monopoly.

Valuation Decision Is Upheld

The Supreme Court of Pennsylvania has handed down a decision that the County Commissioners of Westmoreland County could not appeal from the ruling of the Court of Common Pleas in fixing the valuations of coal lands for taxation purposes.

The Common Pleas Court of Westmoreland County sat as a board of revision and appeals June 11, and heard the complaint of the Pittsburgh Coal Co., Henderson Coal Co., Monongahela River Consolidated Coal & Coke Co., Elizabeth Stauffer Moore, Laura A. Hasson, Monessen Coal Co., Shenango Furnace Co., Pittsburgh-Westmoreland Coal Co., and the Naomi Coal Co. The Court ruled that the county commissioners had exceeded their authority in fixing the value of coal lands for taxation purposes and ordered relief for the coal-land owners.

The county commissioners then carried the case to the Supreme Court of the state, which held that the commissioners' appeal would not lie, dismissed the case and directed that Westmoreland County pay the costs.

PENNSYLVANIA

Anthracite

Hazleton—The Lehigh Valley Coal Co. has made arrangements for opening a new coal stripping between Drifton and Freeland, extending toward Highland.

Wilkes-Barre—The various United Mine Workers locals have received notice that the levy of 50 cents per month on all members will be continued for the time being for the benefit of the striking Colorado miners and their families. District No. 9, has also made a loan of $25,000 to the striking miners in the Colorado District.

Shamokin—Coal companies who maintain alleged blacklists whereby a number of employees are discriminated against and which prevents them from getting positions at the mines of such corporations, were scored by a number of delegates at the annual convention of the Ninth District United Mine Workers. A resolution was offered to have the convention go on record condemning the practice.

Scranton—Pending a report from the special commission which is to make an examination of the conditions underlying West Scranton and also to check up the work of the city mine cave commission, the members of the West Scranton Surface Protective Association have deferred action on the propositions submitted by the People's Coal Co. to serve as a solution of the mine-cave menace in that section. The latest offer of the People's Coal Co. was submitted in a report from a committee of twelve. Briefly, the offer is that, commencing in November, the company will set aside ten cents on every ton of coal mined, this amount to be used as a fund for assisting in the repairing of frame buildings, etc., damaged by caves

Bituminous

Washington—In the suit of the Pittsburgh Coal Co. of Penn. against W. H. Brunt, executor of Francis L. Robbins' will et al., exceptions to the adjudication of the court, an opinion has been handed down, overruling all exceptions and directs the adjudication to stand as heretofore filed. This is the action involving the deed to 97 acres of coal, underlying the Washington fair grounds. The amount of the claim against the estate is about $300,000, Francis L. Robbins, who formerly owned the land, was at one time president of the Pittsburgh Coal Co.

Johnstown—Judge Stephens scored mine officials who violate the state mining laws in no meek terms, when William Roberts, a mine foreman, plead guilty to violating the mining laws. Some time ago Superintendent Andrews of the mine in which Roberts is employed plead guilty to making false air returns to the mine inspectors and blamed his trouble on Roberts, stating the foreman had made false returns to him in the air tests. Roberts placed the blame on the gage which he used in testing the air, stating that it was defective, and that as a result no return of the air pressure was made by him.

Waynesburg—The W. Harry Brown Coke Co. is making extensive preparations previous to the operation of the new mine which is being opened in the Dunkard Creek region. Several months ago the Brown Co. purchased a tract of 1500 acres and immediately let contracts for the development of the underlying coal. The Brown Co. has purchased the steamer "G. W. Thomas" from the Peoples Coal Co., which has been idle for the past three years. In addition to purchasing the steamer it is authentically reported that several other important steps had been taken toward the immediate development of the mine on the Gray Landing. No coke will be made except at the Alicia plant. It being the plan to transport the coal down the river.

Charlerol—Negotiations have been completed and the work of title investigation and deed transferring is now underway for the sale of a 5000-acre block of coal in Cumberland township, Greene County. A large steel corporation operating extensively in the Pittsburgh district is reported to be the purchasing company. Western Pennsylvania financiers and coal dealers, among whom is said to be J. V. Thompson, the Uniontown coal king, are rumored to be the sellers of the tract. Approximately $5,000,000 will be paid for the coal, at the rate of $1000 an acre.

WEST VIRGINIA

Elkins—The Jenkins Coal Co., which has been operating a small mine near Mabie for some time, has commenced the construction of extensive mining operations near the same place. Within the next few weeks a considerable plant of modern electrical mining machinery will be in operation, which will vastly increase the output of the mines.

Fairmont—The car supply in this region is anything but ideal. On Oct. 22 the Consolidation Coal Co. had no less than 42 mines shut down on account of lack of cars. It is claimed by the railroad authorities that these conditions will be improved when the Monongah Cutoff is constructed.

Williamson—A combination of capital represented by Patrick Grady has leased several hundred acres of coal land owned by the Lawson Land Co. surrounding this city. A large coal operation will be started in the immediate future with the tipple in the Norfolk & Western yards. The plant will be operated by elevator conveyors, and the Norfolk & Western Ry. will consume the entire output.

TENNESSEE

Briceville—Citizens of Briceville are contributing generously for the purpose of building a monument to the memory of the 84 men and boys who lost their lives in the Cross Mountain mine explosion of Dec. 9, 1911, near that place. Employees of the Coal Creek Coal Co., the Tennessee Coal Co., the Minersville Coal Co., the Westborne Coal Co., the Caryville Coal Co., the Sun Coal Co., the Egan Coal Co., the Peabody Coal Co., the Rich Mountain Coal Co., and the Kimberly Coal Co. among others in that section, and many other citizens, have made substantial contribution to the fund, and indications are that a sufficient sum will be collected to erect a handsome memorial.

Jellico—Plans are under way, supported by a number of the coal companies in and around Jellico, Tenn., for the establishment of a permanent mine rescue school at that place, for the purpose of facilitating the thorough instruction of miners in first-aid work. E. B. Sutton, who is connected with the mine-rescue station at Knoxville, Tenn., will have charge of the school, if sufficient interest is taken by the operators to warrant its establishment, and modern equipment will be secured and used in order to get the best results. Examinations will be conducted following the demonstrations of various phases of rescue work, and first-aid certificates awarded to the men who show a proper understanding of the methods used.

KENTUCKY

Lexington—The next examinations for the purpose of determining the qualifications of applicants for mine foremen's certificates will be held at the office of the Inspector of Mines at Lexington, Ky., on Monday, Nov. 24. The examinations will continue for several days.

Whitesburg—It is reported that arrangements are under way for another big development project in the Lower Boone's Fork section, J. L. McCormick, of Big Stone Gap, Va., D. C. Anderson and J. B. Altemus, of Philadelphia, being among those interested. These men arrived at Whitesburg recently and left for the section referred to, for the purpose of laying out plans for the beginning of active development work. It is said that several million dollars will be expended on mining operations and the building of two new industrial towns.

Harlan—Negotiations are under way by the Harlan Coal Mining Co. for the purchase of mechanical equipment for its Coxton No. 2 mine, which it will operate. The equipment will be of the most modern character, and as good as anything now installed in Kentucky.

OHIO

Columbus—The past week was taken up by the Ohio mine commission in taking testimony from both the operators and miners on the question of paying for coal mined on the mine-run basis. The miners produced testimony in an effort to rebutt the evidence of the operators. The following week will be given over to arguments and after that the report will be prepared.

Logan—Over 100 men have been employed at the Peabody Coal Co.'s mine at Job, Hocking County, and it is believed that 200 more will be taken on soon. In the future it is expected to operate the mine 12 months out of the year. The mine had been closed since last February.

Massillon—What is said to be the last existing undeveloped acreage of genuine Massillon coal has just been opened by the Pocock Coal Co., of Massillon, near Newman. The coal once made the Massillon district famous. The mine was opened after several companies had drilled the 40-acre tract and decided that no coal was to be found. At one time thousands of miners were employed in that district, but as the coal became exhausted the industry died out. The new mine will employ several hundred men.

INDIANA

Evansville—Judgment was rendered recently in the Federal Court at Evansville, in favor of Henry B. Walker, trustee in bankruptcy of the Kimberly Mining Co., for a 3½ per cent. assessment against the stockholders for the purpose of paying the debts of the company. The assessment will aggregate about $2500.

Fort Branch—After burning two days in a room of a mine of the Fort Branch Mining Co., a fire was got under control. It was caused by shots fired after the miners quit work and slate falling from the roof bottled up the flames. The mine rescue car was called from Clinton.

Sullivan—The suit of the county treasurer versus the Shirley Hill Coal Co., in which the latter sought to enjoin the treasurer from collecting alleged omitted taxes of $2000 has been compromised by the payment of $281.

ILLINOIS

Marion—The strike on the Coal Belt Electric Line, which tied up transportation facilities to the various mines between Marion, Herrin, and Carterville, has been settled, the company granting a slight increase to its employees.

Duquoin—The Paradise mine, the top works of which were destroyed by fire early in the summer, has resumed operations. This is supposed to be one of the best-equipped surface plants in southern Illinois, and it is anticipated that 2000 tons per day will be produced in the course of the next six weeks. This is considered a model mine in the way of conveniences for its help.

Sparta—The Moffatt Coal Co. has removed its general offices from here to the Wright Building in St. Louis, with the purpose of handling the future tonnage through the St. Louis gateway. Mr. W. J. Rich is in charge of the St. Louis office. The Illinois Fuel Co. has likewise made arrangements for selling its tonnage through St. Louis, with the Dealers' Fuel Co. as distributors.

Oakland—While drilling for oil wells on the Nolan and Temple farms near here, a vein of coal was struck 10 ft. thick with a good slate roof, it is reported.

MISSOURI

Kirksville—The Star Coal Co., operating the mine of that name at Kirksville, has completed the installation of electrical equipment in a second vein which is now being worked. A road recently built from Kirksville to the mine has been put into commission, facilitating the company's operations.

IOWA

Cleveland—The old No. 2 shaft of the Whitebreast Fuel Co., abandoned some years ago, has been recently reopened, for the purpose of working the top vein, for the supply of the local coal trade. The shaft was found in a remarkable state of preservation, the walls being in perfect alignment. This shaft was sunk about 1880, and, for 12 years, was one of the largest coal producers in the state. After that time, the output declined and operation was finally abandoned by the Whitebreast company. Lately it has been operated spasmodically to supply local trade.

NORTH DAKOTA

Minot—The machinery for Minot's briquetting plant has all arrived, and it is expected that the plant will be in operation in a short time. This is the first plant of its kind to be built in the state. The methods of operation have, however, been worked out, and it is confidently expected that briquetting will, with the starting of the plant, be placed upon a satisfactory commercial basis.

COLORADO

Denver—Petitions, designed to determine whether public sentiment would support a proposal for the state to seize and operate the coal mines until the settlement of the strike, were put into circulation Oct. 20 by various labor organizations.

Crested Butte—Two hundred and fifty employees of the coal mines in the vicinity of Crested Butte walked out Oct. 20 in sympathy with the striking coal miners in the Trinidad district. They declare they have no grievance except that they wish to have the union recognized.

FOREIGN NEWS

There is an insistent rumor seriously accepted in Europe that China has granted to Japan the exclusive privilege of developing the coal fields of China. If this be true, the concession gives Japan the most valuable monopoly that was ever granted by any nation. China has possibly more coal than is known in all the rest of the world, there being in that country 30,000 square miles known to be rich coal deposits.

Edmonton, Alberta—The coal output of Alberta for 1912 is placed at 3,500,000 tons, out of a total of 13,000,000 tons for all Canada, taking in seven provinces, the Yukon and Northwest territories and the Arctic Islands. Alberta is credited with 14½ per cent. of the total coal resources of the world, the reserves of the province being estimated to contain 1,075,039,000,000 tons as compared with 160,841,910,000 tons for the rest of Canada.

PERSONALS

Samuel W. Eldred, manager of the Wabash Coal Co., was recently elected a member of the executive board of the third district by the Illinois Coal Operators' Association.

All Officials and Directors of the Colorado Fuel & Iron Co., and those of its twelve subsidiary concerns, were reelected at annual meetings of stockholders and directors, Oct. 20.

James Matthews, of Shenandoah, Penn., has been reelected president of the ninth district of the United Mine Workers by a vote of 10,564 against 4338 for Thomas Butler, of Jirardville.

Arthur Mitchell, who has been inspector of mines for the state mining department of West Virginia for the last five years, has resigned to become superintendent of the Marvin Colliery at Matewan. He will enter upon his new duties on Nov. 1.

Myron G. Doll, for several years local manager of the Sullivan Machinery Co.'s office at Salt Lake City, has resigned, and H. E. Moon, heretofore associated with the Denver office of the same company, has been appointed as his successor.

Frank E. Getts, on Oct. 20, took charge as district sales manager of the Chicago office of the Alberger Pump & Condenser Co., of New York. Mr. Getts is well known throughout the United States in connection with important steam turbine installations.

James Abercrombie, mine superintendent at Browder, Ky., for the Muhlenberg Coal Co., suffered an accident at the mine recently which may result fatally. A fall of earth upon a timber in the shaft, upon which he was standing, caused him to fall to the bottom of the shaft, which is about 75 ft. deep. He is believed to be injured internally.

OBITUARY

Edwin M. Crickmer, an extensive coal operator of West Virginia, died Oct. 22 as the result of an injury received in the mine ten years ago. He had been an invalid for a number of years, but his condition was not thought serious until shortly before his death.

H. D. Dennis, president of the Morgan Run Coal Co., of Coshocton, Ohio, died at his home in Cleveland recently at the age of 62 years. For more than 30 years he was connected with the Morgan Run Coal Co. and was one of the best-known coal men in the state.

Gordon C. Wilson, a well known operator of Pittsburg, Kan., fell dead recently at Joplin, Mo. Mr. Wilson was visiting a friend when the attack came, and death was instantaneous. The operator was 38 years old and was interested in several mines in Pittsburg.

Thomas Longstaff, who has been connected with the St. Bernard Mining Co., at Earlington, Ky., for nearly 40 years, died recently at that place at the age of sixty-six. He was buried with Masonic honors. He is survived by his widow and a number of children and grandchildren.

CONSTRUCTION NEWS

Pana, Ill.—The Peabody Coal Co. has started the work of building at Kincaid, about the middle of Christian County, a large power house to furnish electricity to many central Illinois industries.

Butler, Penn.—The Blackstone Coal Co., now holding options on 20,000 acres in Forward and adjoining townships, will soon begin work on a large colliery near Buhl Station on the Baltimore & Ohio R.R., and a new town will be established there. Two additional collieries will be located near McBride.

Sterling, Ill.—The Chicago & Northwestern Ry. is building roads into every coal district which may be easily reached from the main line. The officers and directors have been authorized to extend the line from Girard and Benld 10 miles into Madison County, Ill., also a line into the coal territory west of Miami, Iowa.

Minneapolis, Minn.—The Pittsburgh Coal Co. has plans for the construction of one of the largest, if not the largest, coal-storage plants in the United States. The capacity will be between 20,000 and 25,000 tons. A concrete wall will be put along the sides of the yard, and a "clamshell" handling plant will be installed. It is expected that work upon this plant will be begun early next year.

St. Charles, Va.—The Electric Transmission Co. has been purchased by Samuel Insull, of Chicago, who controlls a large number of public utilities all over the country. The plant will be enlarged at once for the purpose of providing for a much larger production of current. Mr. Insull proposes to utilize the large coal fields in the vicinity of St. Charles for the cheap production of electricity for long-distance transmission, as well as for use in mining operations in southwestern Virginia.

Uniontown, Penn.—Improvements aggregating $90,000 are under way by the Brownsfield-Connellsville Coke Co. at its Martha and Marie mines at Tarr Station, Westmoreland County. Among these improvements are new tipples which are being built at an approximate cost of $12,000 to $15,000. Also 72 new ovens are being erected by the company at the Myers plant. The Wineland-Gilmore Coal & Coke Co. is installing a new plant at Smithton, Westmoreland County. This firm owns approximately 100 acres in its Smithton tract, and is putting in a plant of 60 bank ovens with facilities for shipping both coal and coke. The Luzerne Coke Co. is erecting 36 bank-type ovens at its plant on the Monongahela River between Brownsville and the LaBelle Coal & Coke Co.'s plant.

Cabin Creek Junction, W. Va.—The Virginian Power Co. through its secretary, Wilbur Tusch, is offering an issue of $1,250,000 of its notes, for the purpose of securing funds to complete its steam-power plant and transmission lines by which to handle the electric current which it will develop. The company is said to be constructing its steam plant with a view to developing 26,000 hp., which will be sold to mines in that section, of which there are 222 within transmission distance of the plant, producing more than 19,000,000 tons of coal annually. The company states that it has numerous contracts to furnish electricity to these mines. A future project to be developed by the company is a hydro-electric plant on the New River, which will require a 1400-ft. dam, 125 ft. in height, in order to develop 100,000 kw. Other power sites are controlled by the company on New River, and it contemplates ultimately to transmit electric current to several of the larger cities within a radius of several hundred miles of its plants.

NEW INCORPORATIONS

Williams, Okla.—W. T. Henry, G. T. Williams and S. H. Abbott have incorporated the Williams Coal Co. here, capital $1000.

Dallas, Tex.—An amendment has been filed by the Belknap Coal Co., of Wichita Falls, decreasing its capital stock from $200,000 to $150,000.

McAlester, Okla—The McAlester Coal Co. was recently incorporated here with J. G. Puterbaugh, C. H. Hightower and James T. O'Leary as incorporators.

Coalton, Okla.—The Herron Coal Mining Co., capital $20,000, has been incorporated with W. F. Herron, W. P. Russell and George Arbaugh as incorporators.

Seattle, Wash.—The McKay Coal Co. has been organized with a capital stock of $1,500,000. The incorporators are Jos. J. Henry, Elmer C. Johnson and A. Welch.

Chicago, Ill.—The Scioto Collieries Co., with a capital of $50,000, has been organized to mine coal and manufacture coke. The incorporators are E. S. Cummings, T. J. Tarne and E. Colgan.

Richmond, Ind.—The Alley Monarch Mining Co. has been incorporated here, with $50,000 capital stock, to do coal mining. The directors are J. W. Alley, H. L. Monarch and Fred Hackman.

Charleston, W. Va.—The Laurel Hill Coal Co. has been organized with a capital stock of $40,000, $5000 subscribed and $500 paid in, to do a coal-mining business in Lincoln County. The incorporators are W. C. Walburn, J. H. Marcum, M. L. Duncan, T. R. Walburn and J. A. Wood, all of Huntington.

INDUSTRIAL NEWS

Martinsburg, W. Va.—Several Martinsburg gentlemen, headed by H. H. Emmert and W. A. Roush, have completed a deal for 1000 acres of land in Shelby and Fayette Counties, Ill. An 8-ft. bed of coal runs through the property.

Johnson City, Ill.—The Link Belt Co., of Chicago, was recently awarded the contract to put in the screens at the Lake Creek mine of the Consolidated Coal Co., of St. Louis. This mine has a tonnage now of 500 tons, getting out of the development stage.

Wheeling, W. Va.—There will be a special meeting of the stockholders of the Wellsburg, Bethany & Washington R.R. Co. on Nov. 12 in this city. This meeting is called for the purpose of considering the sale of valuable coal lands owned by the company.

Clarksburg, W. Va.—The Hutchinson Coal Co. has taken over the holdings of the Short Line Coal Co., consisting of a mine and 200 acres of coal at Dola, on the Short Line R.R., between Clarksburg and New Martinsville. The new owners will put in a first-class mining plant.

Charleston, W. Va.—Awaiting a rise in the Ohio River, 390 barges carrying 5,000,000 bu. of coal were assembled Oct. 24 at the mouth of the Kanawha River ready to go through Lock 2 as soon as the stage should be sufficiently high to float them down to Cincinnati and Southern points.

Dubois, Penn.—The opening of traffic on the Pittsburgh & Shawnut R.R., between Kittanning and Brookville, was accomplished on Oct. 20, when the first train was run. This new road traverses a territory which has hitherto been difficult of access, but which is, nevertheless, thickly populated.

Ebensburg, Penn.—Acting for others, A. W. Buck, of this place, purchased all the coal land, machinery, buildings and equipment of the Auld Run Coal Co. at forced sale. The coal lands lie in the Brushvalley district, in Indiana and Cambria Counties. It is understood that the mines will be reopened and operated on an extensive scale.

Connellsville, Penn.—John A. Bell and associates have purchased the property formerly owned by the Washington County Coal Co. lying in Jefferson Township, Washington County. This consists of about 800 acres of Pittsburgh coal and surface upon which the Cedar Grove mine was opened about five years ago. It is understood that necessary repairs will be made and the mine reopened shortly.

Reynoldsville, Penn.—A coal deal, which is regarded as one of the largest ever put through in Indiana County was practically consummated when the Manor Real Estate & Trust Co., of Philadelphia, secured the holdings of the Greenwich Coal & Coke Co., a tract of something over 27,000 acres in Green and Buffington Townships. The consideration is not known, but it is said that the figures will run well up into the hundreds of thousands of dollars.

Pittsburgh, Penn.—In September the Pennsylvania lines east of Pittsburgh and Erie carried 6,319,382 tons of coal and coke, an increase of 404,055 tons. Bituminous tonnage increased 471,873 tons, coke increased 54,338 tons, and anthracite decreased 122,156 tons. Coal and coke tonnage for nine months totaled 56,208,756 tons an increase of 5,125,517 tons. Bituminous tonnage increased 3,660,264 tons, coke increased 1,188,070 tons, and anthracite increased 277,183 tons.

COAL TRADE REVIEWS

GENERAL REVIEW

Market fails to show a further expansion. October business in anthracite below the average. Confusing cross currents and uncertainties in the bituminous situation. Market showing a softening tendency which is compensated for by decreased shipments due to restricted car supply.

Despite important restraining influences, such as a relapse into unseasonable weather conditions, increasing conservatism in general business, and a continuation of the record-breaking movement of coal, there has been nothing more serious developed than a mild lull. Even this is regarded as more or less temporary, and is the inevitable accompaniment of a protracted between season's market; no further expansion is anticipated until the trade definitely turns the corner and enters upon the winter's activity. On the other hand, uncompromising adherence to regular schedules is the rule with the leading producers and no element of infallation is perceptible at any of the large distributing centers.

In anthracite the mild weather is tending to hold down the demand, but a cold snap will soon create an active situation. Stove coal is in short supply, and is the feature of the market; aside from this there are quite a number of complaints about the poor business during October, which is ordinarily a big month in the hard-coal trade. Production has been curtailed by an inadequate supply of cars, a rather unusual feature in anthracite at this period of the year.

The bituminous market is subject to confusing cross-currents and uncertainties. The situation at New York has firmed up to such a degree that an advance in quotations is necessary. On the other hand, New England reports a general lack of interest on the part of buyers with orders confined chiefly to extensions of previous sales. In spite of an inadequate car supply and a poor movement, there is plenty of coal at tide. In view of the fact that production is well covered by contracts it is thought that there is not sufficient free coal on the market to seriously effect the situation.

Decreased requirements in the iron and steel industry in the Pittsburgh district has curtailed the industrial consumption, but retail demand has, on the other hand, been stimulated by the recent fall in temperature; while the general market is strong at the moment, it is generally felt that a certain weakness cannot be avoided when the lake shipping closes. Ohio continues reporting a consistently strong market, due probably to the acute situation in transportation. The new advanced price level is being firmly maintained with the tendency, if anything, toward a further increase.

The car shortage is also a controlling factor in the Middle Western situation, and there is a general feeling of uncertainty pending further developments. There is a brisk demand, while the lack of equipment is having a steadying influence, but the volume of business is not so large, and two or three weeks of mild weather will cause many cancellations.

BOSTON, MASS.

No material change in Pocahontas and New River. Transportation beginning to reach Hampton Roads with something like regularity. Georges Creek in light demand but the better Pennsylvania grades continue fairly firm. Stove size increasingly short and anthracite generally in firm position.

Bituminous—The mild situation of a week ago continues without material change. There is a general lack of interest here in Pocahontas and New River not only for spot shipment but for a month ahead and what orders come in are chiefly extensions of previous sales; $2.85 is frequently heard now as a price at which surplus tonnages are being moved at Hampton Roads and while some of the operating interests are able to command 5@10c. more the amount of the business is small and hardly significant. Transportation is just beginning to arrive with something like regularity.

New England, is taking things easily and nothing short of pinch conditions would stir up any active interest in Southern coals. Some large consumers are even seeking to have contract shipments postponed. The inland trade is well supplied and there is little inquiry; 130,000 tons arrived in Boston in one day last week.

From being the scarcest grade in the market, Georges Creek has lately come to tide in good supply and consumers are being urged to accept deliveries on contracts. So many consumers, however, had arranged for Pennsylvania when Georges Creek was not to be had that the outlets are now rather narrower than would have been supposed.

The Pennsylvania grades, especially, the quality coals, continue to show a firm undertone, with prices little changed. Most of the Cambrias and Somersets find a ready sale and the better coals from Clearfield may be included in the same list.

Anthracite—An increasing number of shippers are curtailing the proportion of stove size in any one cargo and notwithstanding frequent warnings many of the Eastern dealers have calmly taken on liberal supplies of egg and nut hoping for better shipments on stove as the season advanced. They now find themselves in a hard place, with stove almost as scarce as a year ago. The mild weather is holding down the demand at retail but given a cold snap there will be something of a strained situation. Stove is already commanding a premium f.o.b. with some of the individual shippers and there is likely to be more of the same talk as November comes along.

Quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$1.05@1.65	$1.30@1.75	$1.67@1.77	
Philadelphia*	2.30@2.90	2.55@3.00	2.92@3.02	
New York*	2.60@3.20	2.85@3.30	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.85@2.95
Providence†				3.73@3.88
Boston†				3.83@3.93

*F.o.b. †On cars.

NEW YORK

Cold snap of last week stimulated retail anthracite; wholesale continues moderately quiet, but with an excellent undertone. Bituminous improved and quotations advanced. Supplies at tide relatively low.

Anthracite—The warm weather continues to have a restraining influence upon the hard-coal situation, but the cold snap of last week had a stimulating effect on the retail businees, which is still in evidence. The market continues to be a weather proposition. But even as it is, the mines are working up to full capacity and the production is so heavy that there are reports of a car shortage at some points. An active situation is anticipated when the cold weather does appear.

Stove coal continues the leader in the market, and is in short supply at all points. Chestnut is improving and is moving much better, while egg is heavy. The steam sizes are being well taken care of. The better grades of No. 1 Buckwheat are in short supply and active with the poorer grades quiet. The good grades of No. 2 Buckwheat are still short, while No. 3 is easy on all kinds with the poorer qualities notably heavy.

We quote the local hard-coal market slightly higher as follows:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	$5.00	.....	$4.95	
Egg	5.25	$5.15@5.25	5.20	$5.00@5.20
Stove	5.25	5.25@5.50	5.20	5.20@5.45
Chestnut	5.50	5.40@5.50	5.45	5.35@5.45
Pea	3.50	3.40@3.50	3.45	3.35@3.45
Buckwheat	2.75	2.60@2.75	2.45@2.70	2.00@2.70
Rice	2.25	2.25	1.95@2.20	1.75@2.20
Barley	1.75	1.75	1.70	1.50@1.70

Bituminous—A slightly stronger tone is noticeable in the local soft-coal market due probably to both interruptions of work in the mining regions and to transportation. Water shipments were seriously restricted for a time due to inclement weather, but the situation in this respect is much relieved at the moment. The stocks at tide are reported relatively small and there is the feeling that better prices are inevitable when the turn in the weather conditions is finally realized.

On the other hand, it is believed that the consuming interests are much better stocked than ordinarily; in fact, it is pointed out that the liberal stocking on the part of the railroads has been the cause of the market being so well maintained throughout the summer. The car supply continues moderately short, but it has not become any worse so far as can be seen.

In view of the improved condition in the market, we quote all grades somewhat higher this week as follows: West Virginia steam, $2.65@2.75; fair grades of Pennsylvania, $2.75@2.85; good grades of Pennsylvania, $2.85@2.95; best Miller Pennsylvania, $3.15@3.25; George's Creek, $3.20@3.30.

PHILADELPHIA, PENN.

Complaints of slow business in anthracite, as compared with previous years. Trade as a rule apathetic, but production heavy and the movement good. Broken coal out of the market.. Car shortage developing.

The weather is still the determining factor in the situation in this vicinity. The retail-market orders are coming in very slowly outside of the demand for stove coal. As a matter of fact, many dealers are complaining about the lack of business, and compared with previous years, October does not look as favorable. As a rule, this month usually sees a heavy business both with the wholesale and retail dealers; the apparent apathetic condition of the trade can be traced entirely to the unusual weather conditions, and no activity is looked for until there is a change in this respect.

Egg and chestnut coal still seem to be in easy supply; pea coal is picking up, but broken and stove are the only sizes for which there is an active demand. It is almost impossible to secure any tonnage of broken coal unless at the full circular price; this size is contracted for at the beginning of the season and many of the companies report that they are behind on deliveries, so that it is manifestly impossible for them to consider any additional business, even at the full circular prices.

One still hears of discontent due to the imposition of the state tax, but up to the present, no concentrated effort on the part of the retailers has been made to saddle it on the consumers; most of the dealers are still absorbing it.

Operations at the collieries has been much handicapped during the past week, with an unusual car shortage. This has been growing more acute weekly, and nearly reached a point during the past week, when it would prove more than serious.

Bituminous trade is about on a parity with the week previous. There were no unusual advances in prices and no reports except that all grades were holding their own, with the demand excellent, and production about equal to the call.

BALTIMORE, MD.

Weakening tendencies exhibited by the market. The Western demand showed a decline for the first time. Warmer weather conditions take away the prop of the previous week. Cars in rather poor supply.

The past week showed indications that the market would soon take a drop. Demand was the lightest for many weeks past, and despite a rather poor movement, due to restricted car supply, there was plenty of fuel at tide to meet all calls.

Concerns here with West Virginia connections reported that the rush of three-quarter gas coals toward the Great Lakes had slowed up to a considerable degree. Congestion at the shipping centers was given as a reason, and it is said that about all the fuel is now on hand that can be conveniently handled. A vast amount of coal is reported on cars at the lake ports. Fuels that had been bringing from $1.15@1.20 f.o.b. mines are now offering about 10c. off: Run-of-mine coal in West Virginia was offered down to the dollar mark, although most sales were above that figure.

Pennsylania steam coals are reported in poor demand, with railroad orders generally scarce. Sales are made around $1.20@1.25 that several weeks ago were bringing $1.35@1.40. It must be said, however, that there is not any great quantity of the coal not under contract, and the lull is probably more or less temporary.

As a whole the market is expected to pick up rapidly soon, unless there is a decided change for the worse in general industrial conditions. Warmer weather the past week undoubtedly took away the prop that had kept the market from a slump a week earlier.

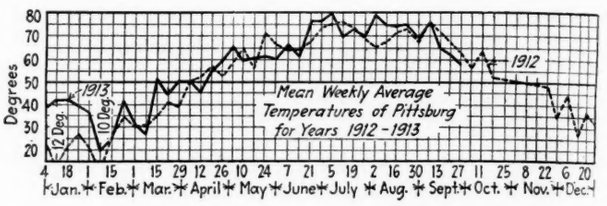
Anthracite conditions are normal, a fair call being noted for steam sizes, and the prospects being good for domestic coals when the first real winter weather appears.

PITTSBURGH, PENN.

Somewhat decreased industrial demand for coal, with increased demand for domestic, and occasional price advances in the latter. Car supply poor. Shipping stage in Ohio River permits dispatch of large fleets to down-river points. Connellsville coke market stagnant, with prices nominally unchanged.

Bituminous—There has been a considerable decrease in the fuel requirements of the iron and steel industry; in the past week or two there has been a decided slowing down and the prospect is clear for further curtailment of iron and steel output in the future. At present the mills are running at about 80% of capacity, but they are curtailing their supplies of all sorts in greater ratio, in view of the prospects.

Retail demand for coal, on the other hand, has increased, and some operators have made a further advance in 1¼-in. domestic, so that occasionally there are quotations above $1.75. A few have also marked up slack. Car supply continues poor. At the moment the coal market is fairly strong, but some decrease in strength can hardly be avoided when the Lake shipping season closes. We quote for prompt and near-forward delivery: Slack, $1@1.25; mine-run, $1.40@1.50; ¾-in., $1.50@1.60; 1¼-in. domestic, $1.65@1.75, per ton at mine, Pittsburgh district.



A rise in the rivers permitted shipments down the Ohio to begin Sunday, Oct. 26. On that day the Monongahela River Consolidated Coal & Coke Co. sent out six fleets of 22 barges each and three with 17 boats each, while the Diamond Coal & Coke Co. sent two fleets of 10 barges each, the total shipments amounting to about 33,866,000 bushels, or about 150,000 net tons, and additional shipments are being made as steamboats become available.

Connellsville Coke—The market continues altogether stagnant. There is no disposition to increase pig-iron production, but rather to curtail somewhat. The operating furnaces are all covered by contracts and the disposition of operators is to overship, so that practically no demand comes into the market for prompt coke. No one is disposed to consider seriously the question of contracts for the new year. The market remains quotable: Prompt furnace, $2@2.15; contract furnace (nominal), $2.25@2.50; prompt foundry, $2.75@3; contract foundry, $2.75@3.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 17 at 379,605 tons, a decrease of 7285 tons, and shipments at 384,013 tons, a decrease of 5932 tons.

Later—The group of Connellsville coke operators who have been holding out for the $2.50 price on furnace coke have abandoned their efforts and will now meet the market. They have just sold 10,000 tons to an Eastern steel interest at $1.90 for November shipment, and the furnace coke market is now quotable on the basis of $2@2.15 for prompt or contract, with possibilities of a still further shading.

BUFFALO, N. Y.

Bituminous not so firm, but prices holding. Light demand due chiefly to warm weather. Coke continues weak. Anthracite affected by the lack of seasonable weather.

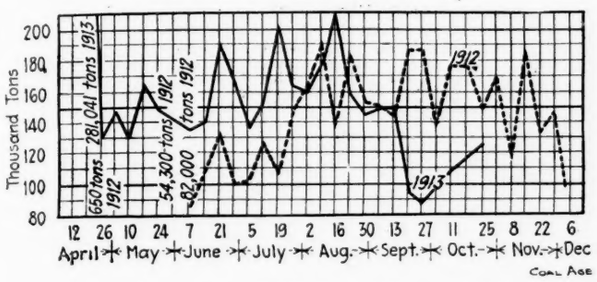
Bituminous—Soft coal is still on its former footing, but as a rule there is a report of general weakness everywhere, with prospects of a decline in prices if the weather continues mild. So far as can be learned the weakness is entirely on account of the weather. The reports of slackness now are not by any means general, but are more common than they were and must be accepted as not without meaning.

The car situation is without any change. The supply is smaller than ever before, not being more than 60 per cent. of the demand on some of the leading coal roads. On the other hand, certain more local lines are providing cars promptly. The reports of strikes and lockouts increase, which, of course, offsets, in a measure, the alleged dullness in general business. There are said to be 800 miners on strike at Rossiter in the Clearfield district over the preparation of the coal and strikes and lockouts are reported in the Bessemer district, caused by the operators opposing the efforts of the men to unionize the mines. These difficulties are local, but they reduce the coal output while they last. The mine owner without coal enough to meet his contracts is not finding it easy to pick up extra tonnage.

Quotations on bituminous remain at $2.90 for Pittsburg lump, $2.80 for three-quarter, $2.65 for mine-run and $2.25 for slack, the latter being very firm; some jobbers say it will sell on a par with mine-run before long.

Coke—The coke market is weak, especially for low grades. While Connellsville 72-hr. foundry is fairly steady at $4.85, it is not easy to obtain $4.35 for 48-hr. furnace; stock coke is a drug, though it is not very plentiful.

Anthracite—The weather has been unfavorable in the anthracite trade also, but the movement is fair. Shippers are steadily short of stove, while they have a surplus of egg. If customers order straight stove or stove and chestnut they run the risk of being refused till they include about an even amount of egg. It is likely that the price of stove will eventually be advanced to a par with chestnut.



ANTHRACITE SHIPMENTS FROM BUFFALO

The effort to accelerate the anthracite movement by lake is only partially successful, as the mines are not producing sufficient. The shipment from Buffalo by lake for the week was 125,400 tons, which is some hundreds of tons short of midsummer shipments. Still, with six weeks more before the lakes close, the supply at upper-lake ports ought to be at least fairly satisfactory. The fleet has been held up considerably of late by storms.

TOLEDO, OHIO

Cool weather stimulated domestic buying. Prices showing an upward tendency. Car shortage seriously interfering with production.

Coal is strengthening on this market, and the past week has noted some changes in the list, all with an upward trend. It is generally believed that prices will be still higher. The recent cool weather has brought about a better domestic demand and the call for steam coal has been good all along. The car situation is tight with little prospect of an improvement for some time at least. There is a decided hold-up from southern Ohio coal fields, and this, of course, affects the lake shipping. Cargoes are not as heavy as is usual at this season of the year for the reason that there is little or no coal on the docks which can be moved. The railroads are loading fully 50% hopper cars which are extremely objectionable to most of the trade, and whenever possible dealers are refusing to place orders in the hope that a little later flat-bottom cars can be obtained.

COLUMBUS, OHIO

New higher prices have been well maintained. Demand for all grades continues good and the production is limited only by the car supply. Colder weather stimulates domestic trade.

The past week has been one of advancing prices and continued good demand in all the mining districts. The new levels announced a week ago have been well maintained and no price cutting of consequence is reported. In fact the tendency is toward premiums rather than discounts and all interested in the trade believe that prices have not yet reached their high point. Demand for domestic, steam and lake tonnage continues strong.

Pressure in the retail trade has been largely responsible for advancing prices, as jobbers in every section are placing orders requesting immediate delivery. Stocks are generally light and every effort is being made to increase them to fortify against a shortage when the severe weather comes. Dealers are getting higher prices than usual for the time of the year and the demand is running more and more toward the fancy grades such as Pocahontas and re-screened varieties.

The car supply is growing less and less and as a result the output is being decreased. According to reports received from all mining districts, Eastern Ohio only produced 50 per cent. of the average and the Pomeroy Bend district showed up about the same. The Hocking Valley reports about 55 per cent. of normal and the domestic fields are no better.

Lake trade is active and will probably continue so as long as navigation is open. The tonnage is falling off but this is a natural result of the increased domestic demand and the growing car shortage. The larger operators which engage in the lake trade will probably ship a greater tonnage than last year. Congestion on the upper lake docks is not great and the interior movement is good.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump	$2.00 @ 1.90	.....	$2.00 @ 1.90	$1.75 @ 1.70
3-4 inch	1.85 @ 1.75	$1.50 @ 1.40	1.85 @ 1.75	1.55 @ 1.50
Nut	1.30 @ 1.20	.....	1.60 @ 1.55	1.25 @ 1.20
Mine-run	1.50 @ 1.40	1.35 @ 1.30	1.50 @ 1.40	1.25 @ 1.20
Nut, pea and slack	0.90 @ 0.85	.....	1.00 @ 0.90	0.85 @ 0.80
Coarse slack	0.80 @ 0.75	1.00 @ 0.95	0.90 @ 0.80	0.70 @ 0.65

DETROIT, MICH.

Bituminous steady after a slight reaction. End of month develops some business. Conditions not materially changed.

Bituminous—There has been little change in the local situation, and prices are being well maintained all along the line. There are unconfirmed reports of some producers seeking extra business who have made concessions in one way or another, but such business cannot be considered as the real market.

In the domestic market, smokeless coal is quiet. There seems to be a slight over-supply of this grade, and diversion and reconsignment of shipments to other points have ceased. This slowing down in business is giving the operators a welcome opportunity to increase shipments in the Lake trade from which there is a heavy demand. The semi-smokeless coals are bringing nearly Pocahontas prices; large stocks of these grades have been bought for domestic purposes, and now that Pocahontas is easier in the market, it is rather difficult to dispose of.

The market is now quotable on about the following basis:

	W. Va. Splint	Gas	Hocking	Cambridge	No. 8 Ohio	Pocahontas	Jackson Hill
Domestic lump	$1.65	....	....	....	....	$2.50	$2.50
Egg	1.65	....	....	....	....	2.50	2.50
Nut	1.50	....	....	....	....	....	....
Steam lump	1.50	....	....	....	....	....	....
3-in. lump	1.15	$1.20	$1.15	1.10	1.10	....	....
Mine-run	1.10	1.10	1.10	1.10	1.10	....	....
Slack	0.85	0.85	0.75	0.75	0.75	....	0.85

Anthracite—Hard coal shows some briskness, due to a fall in temperature and the anxiety of dealers to accumulate an adequate supply before the winter's demand opens up. Jobbers, however, are not anticipating a very large business before the middle of the current month.

LOUISVILLE, KY.

Fall in temperature stimulated activity in the domestic grades. Steam coals also strong. Eastern Kentucky companies handicapped by poor car supply. Screenings weak.

Some rather snappy weather during the week past resulted in the usual flood of small orders which was reflected immediately to the mines and made business good on the prepared grades everywhere. The earliest snow in years fell through Kentucky on Oct. 21, and the number of small consumers who were caught unawares made things active for several days.

The steam market is also much stronger than a week or so ago, especially on eastern Kentucky coal. Prices are not especially high, considering the season, but the relatively limited supply of the better grades keeps the demand well balanced. About 80c. a ton f.o.b. mines is the average price, with second grades, including eastern and western Kentucky, from 15c. to 20c. lower.

A number of eastern Kentucky operators have lost about one-third time lately on account of the poor car supply, and it is extremely unlikely that this condition will improve as the season advances. Experience has proved to the contrary, and operators are, therefore, doing their best to prepare for a material shortage in transportation facilities.

As indicated, prices are improving all along the line. The November basis for eastern Kentucky coal is about $2.35 a ton for block, with isolated sales as high as $2.50 a ton, the second grades ranging from $2.10@2.25 a ton. The demand for western Kentucky domestic is also improving, block being strong at $1.25@1.40 a ton f.o.b. mines. There is little mine-run coal moving in any portion of the state.

HAMPTON ROADS, VA.

October will be a big month at the Hampton Roads piers. Shortage much easier than for some time. Domestic business beginning to open up. Rumors of a new big coal consolidation.

Shipments of coal over the piers at Hampton Roads continue brisk; large cargoes have moved coastwise and foreign, and the call for bunker coal has also been heavy. Present indications are that all piers will show up with a large tonnage dumped during the entire month, and unless the unforeseen happens the piers at Sewalls Point will again break their record. In addition to the movement of Pocahontas and

New River there has also been some shipping of high volatile and nut and slack coals to the New England market. Prices on all grades remain practically the same as they have been for the past two or three weeks.

There is a fair accumulation of coal at tidewater, and while some suppliers are short others have sufficient to take care of tonnage now due with some little free coal. Several large cargoes have been sold during the week and Government colliers have taken in the neighborhood of 30,000 tons in addition to the coastwise and foreign shipments. Vessels taking foreign cargoes have cleared for Havana, Santiago, Dakar, Trinidad, Cavite, St. Lucia, Canal Zone and Curacoa.

Reports are current here that negotiations have been closed by an English syndicate for the purchase of extensive coal properties in the New River fields of West Virginia. It is impossible, however, to get the report confirmed here. One of the largest companies mentioned as having been purchased have given out the statement that so far as they are concerned the report is without foundation.

Owing to the fall in temperature during the last few days retail business has picked up considerably although there is yet some complaint among the dealers as to poor sales. There has been no advance in prices for domestic grades, summer rates still prevailing.

BIRMINGHAM, ALA.

Demand for steam coal quiet, but domestic improving, due to the recent cool weather. Practically no furnace coke moving. Foundry coke quiet with sales limited to small shipments. Some improvement in blacksmith coal. Pig iron dull, though price is holding up well. Car shortage still evident.

The past week has brought no relief to the stagnant steam-coal market, the production being in excess of the demand, though none of the operators are making concessions in prices, believing this condition to be only temporary. Due to the recent cool weather, the domestic lump has taken on a more cheerful aspect, though the market is far from being satisfactory. Inquiries on blacksmith coal are increasing, and business on that grade is the most satisfactory of any.

There is practically no furnace coke moving out of this district, and foundry coke only in small quantities. Pig iron is very quiet, few sales being made during the past week, though at a better price than formerly, the basis being strictly $11.50 per ton on 2 Foundry for the balance of this year. Very little tonnage was booked for next year. While it would seem that the car supply would improve, with the quiet business, there is little change over last week. Some of the railroads are taking care of their mines fairly well, but those on the Southern Railway are suffering greatly for the lack of cars.

NEW ORLEANS

New coal transportation company announces big cut in prices. Completion of government work on Warrior River opens all water route for Alabama coal into this port.

While it has not been proved that coal can be brought to New Orleans from the Alabama fields by water at a cheaper rate than by rail, there is no question that the up-river Mississippi interests are worried. The formal announcement this week, by the president of the transportation company, which expects to handle this business through the Warrior, Tombigbee and Alabama Rivers, that coal would be sold in New Orleans 50c. under the present price, has caused something of a flurry.

The working out of the experiment is being watched with the greatest interest. It is suggested that this is the reason for the delay in the preparation for export business that could be brought to this port after the opening of the Panama Canal. There are seventeen locks to be passed in the Warrior River and whether the big self-propelled brages will be able to handle this business as cheaply as is expected remains to be seen.

INDIANAPOLIS

Notwithstanding mild weather, domestic trade continues good. The call for screenings not yet back to normal. Complaint about the car situation continues. Mine operations are cut down. There is little heavy demand, however, among consumers, on account of this situation.

The little spurt of cold weather was helpful to the coal trade, especially the retail department, but it has been succeeded by another mild spell. The short car supply is a large factor in the trade, yet the situation does not seem to differ much from that existing any year at this time. It is true, however, that it is affecting mine operations to the extent of about 30% in this state.

The screening situation does not improve much, and operators are puzzled as to why it does not get back to normal. Industrial conditions in the state seem to be about as active as usual and the mild weather is not regarded as a weighty factor. It is believed by some that the large Chicago agencies are buying at outside points to give the Indiana mines the impression that they are not in the market. The domestic situation is strong. Supplies of Eastern coal are slow to arrive, but this is not causing distress yet as yard stocks seem to be of good size. In fact, if the mild weather keeps up two or three weeks, there will be many cancellations of orders. The following range reflects Indiana prices f.o.b. mines:

Mine run No. 4	$1.10@$1.35	Domestic lump No. 5 & 6	$1.50@ 1.75
Mine-run No. 5 and 6	1.05@ 1.10	Screenings No. 4	0.60@ 0.90
Nut	1.25@ 1.35	Screenings No. 5 & 6	0.50@ 0.60
Egg	1.40@ 1.60	Brazil block	2.00@ 2.25
Domestic lump, No. 4	1.75@ 2.00	Washed coal at premium of 25c. a ton	

The chief trouble now is in the car shortage due, apparently, to the lack of motive power. A committee of operators sent a communication to the commission stating that in more than 200 instances, coal equipment had been held for weeks in Indianapolis yards while the mines were suffering for cars, also that 350 carloads of coal are on track in this city almost every day and there is no power to move them. The commission learned that the New York Central and Pennsylvania companies are contemplating a belt line around the city, which would eliminate the congestion of freight traffic.

CHICAGO

Demand continues brisk, but sales are somewhat less than customary for this time of the year. Shrinkage in the car supply has tightened the market on Eastern coals. Demand for gas-house and byproduct coke materially increased. Carterville operators report heavy buying of all sizes. Heavier sales of anthracite.

While the demand for coal in the Chicago market continues brisk, the general volume of business is somewhat under the records for October in previous years. A shrinkage in the car supply is the chief factor in the Eastern coals in this market. The position of the smokeless grades, especially, has been strengthened on this account. There has been a distinct revival in the buying of this coal and a previous wavering tendency in the market has disappeared.

A greater demand in the Western market and a lessening in the supply of freight equipment has caused the additional strength noted in the anthracite trade. Chestnut continues to be short of the demand. It is estimated that Eastern operators are obtaining about one-half the cars they need and that the supply for Western producers ranges between 60 and 75%.

Small shipments of Hocking coal has created an unsatisfactory condition in this section, and the supply falls short of demand by a substantial margin. Additional firmness is reported in the coke market. There has been a marked increase in orders for gas-house coke and the byproduct variety is in greater demand. The latter now sells at from $4.90@5.10. Similar strength is lacking so far as furnace and foundry coke are concerned. The recent announcement of E. H. Gary, chairman of the board of directors of the United States Steel Corporation, that there will be no shutdown of the mills at Gary, Ind., however, has given operators increased confidence in the future.

A strong demand for all sizes of Carterville coal has been reported by operators in that district. Domestic lump and No. 1 washed sell, as a rule, at $2 a ton, the mines. A considerable amount of egg is being sold at high figures for retail consumption. In the territory surrounding Franklin County, domestic lump is selling at from $2@2.25, the mines, while in districts farther distant prices are somewhat under these figures. Springfield operators have failed in their effort to boost the price of domestic lump to $2, and it is now firm at $1.75.

Prevailing prices at Chicago are:

	Springfield	Franklin Co.	Clinton	W. Va.
Domestic lump	$2.57	$3.05@3.30	$2.52	
Steam lump	2.07		2.07	
Egg		3.05@3.30		$4.30@4.40
Mine-run	1.92	2.40@2.55	1.87	3.45@3.55
Screenings	1.12@1.22	1.55@1.80	1.12@1.22	

Coke—Connellsville, $5.50; Wise County, $5.25@5.50; byproduct, egg and stove, $4.90@5; byproduct, nut, $4.95@5.10; gas house, $4.65@4.75.

ST. LOUIS, MO.

Market uncertain pending further developments. Car shortage having a steadying effect. Anthracite moderately active. Steam coals heavy.

An unsteady market for the past week has kept the trade in a somewhat uncertain channel, expecting that every day would bring something to base future prospects on. The weather has been mild and the anticipated demand and advance in price did not come.

The only thing that stimulated the market at all was the car shortage, which became more pronounced the past week, and has a somewhat serious aspect now. On the Illinois Central the mines are now getting about two or two and a half days per week, the C. & E. I. about three days a week, and the Iron Mountain about the same. The roads from the inner fields are in somewhat the same trouble, the Southern giving its mines about two days a week, the L. & N. about three, the B. & O. four, and the Vandalia five. The Wabash is in perhaps the worst condition of all, for what little equipment they have is usually in bad order.

There has been a fair demand the last week or so for anthracite, especially in the larger sizes. Gas-house coke is also in some demand but byproduct is a drug. Smokeless is moving better than was anticipated. The local steam market is still dragging and Standard coal when averaged up is barely bringing the cost of production.

The prevailing prices are:

	Carterville and Franklin Co.	Big Muddy	Mt. Olive	Standard
2-in. lump	.....	.....	.....	$1.10@1.20
3-in. lump	.....	.....	$1.50	.....
6-in. lump	$1.75 @ 2.00	.....	1.60	1.40@1.50
Lump and egg	1.50 @ 1.60	$2.25	.....	.....
No. 1 nut	1.50 @ 1.75	.....	.....	1.10
Screenings	0.50 @ 0.60	.....	.....	0.20@0.25
Mine-run	1.10 @ 1.20	.....	.....	0.90
No. 1 washed nut	1.80 @ 1.90	.....	1.40	.....
No. 2 washed nut	1.30 @ 1.40	.....	1.60	.....
No. 3 washed nut	1.10 @ 1.15	.....	.....	.....
No. 4 washed nut	1.05 @ 1.15	.....	.....	.....
No. 5 washed nut	0.35 @ 0.40	.....	.....	.....

KANSAS CITY, MO.

Weather conditions favorable. Gas supply still limited. Full-time operations general.

A sudden drop of the thermometer was responsible for a rush during the past week. Though the cold weather was short lived, people who had about made up their minds to get along with gas during the coming winter promptly decided that a change of attitude was necessary. Practically all ordered coal and indications are that demand will continue strong during the next few months.

Many plans have been advanced to increase the available supply of natural gas here, but none is regarded as practicable. Officers of the piping company assert that the supply is restricted, and the coal situation is being benefited to a marked extent. All mines are working full time with the exception of a few which close down occasionally because of the shortage of transportation facilities.

OGDEN, UTAH

Warmer weather throughout territory has affected shipments. Shortage of coal in Colorado has absorbed surplus at Rock Springs. Car shortage in Wyoming continues, but situation in Utah has improved. Quotations advanced in southern California, Nebraska and Colorado.

The entire intermountain territory has been enjoying ideal fall weather and the demand for coal has slacked off somewhat. However, the mines still have plenty of lump orders to keep running at capacity. The sugar factories and other steam plants are consuming all the slack and steam coal produced at the mines. At the first of this week there were indications of a surplus of nut coal at the Wyoming operations, but the unusual demand in Nebraska and Colorado allowed the operators to move a larger percentage of this grade into the Eastern market.

A partial car shortage continues in Wyoming, and most of the mines are losing some time on this account. It seems there are plenty of box cars, but open cars for loading slack are very scarce. The conditions in Colorado has assisted the Utah mines, which at present are working full time.

Quotations for southern California have advanced to: Lump, $3; nut, $2.50; mine-run, $1.85; slack, $1. Shipments to Nebraska and Colorado are above normal and quotations are now: Lump, $3; nut, $2.25; mine-run, $1.85; slack, $1. The balance of the territory remains at: Lump, $2.75; nut, $2.25; mine-run, $1.85; slack, $1.

PRODUCTION AND TRANSPORTATION STATISTICS

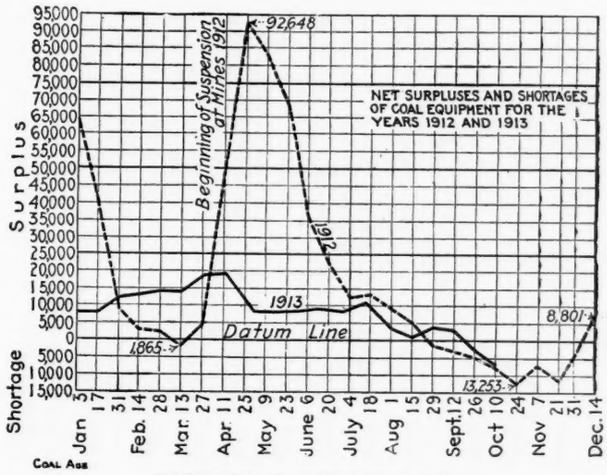
THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Oct. 15, as follows:

	Surplus	Shortage	Net*
New England Lines	86	0	**86**
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	719	2,301	1,582
Ohio; Indiana; Michigan; Western Pennsylvania	200	2,612	2,412
West Virginia, Virginia, North & South Carolina	705	5,028	4,323
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida	125	1,048	923
Iowa, Illinois, Wis., Minn.; North & South Dakota	1,072	350	**722**
Montana, Wyoming, Nebraska	15	51	36
Kansas, Colorado, Missouri, Arkansas, Oklahoma	1,163	227	**936**
Texas, Louisiana, New Mexico	424	27	**397**
Oregon, Idaho, California, Arizona	1,485	166	**1,319**
Canadian Lines	20	692	672
Total	6,014	12,502	6,488

	June 14	June 30	July 15	Aug. 1	Aug. 15	Sept. 1	Sept. 15	Oct. 1
Surplus	11,098	11,055	13,203	8,810	8,293	8,689	8,714	7,953
Shortage	2,033	2,821	1,826	4,029	7,038	5,209	7,731	10,393
Net*	**9,065**	**8,234**	**12,377**	**4,781**	**1,255**	**3,480**	**983**	2,440

***Bold face** type indicates a surplus.



NORFOLK & WESTERN R.R.

The following is a statement of tonnages shipped over this road from mines in West Virginia and the commercial and company coal, for the month of September, in short tons:

Field	Shipped	Tipple	Total	Commercial	Company
Pocahontas	1,216,933	17,144	1,234,077	1,261,363	89,380
Tug River	231,318	3,688	255,045	192,449	42,557
Thacker	225,733	11,054	233,756	165,524	71,242
Kenova	73,090	9,589	82,679	64,860	17,819
Clinch Valley	.....	.....	.....	146,306	15,200
Other N. & W.	.....	.....	.....	4,698	.....
Total N. & W. Fields				1,835,200	236,198
Williamson and Pond Crk. RR.	.....	.....	.....	37,609	5,167
All Other Railroads	.....	.....	.....	200,704	.....
Grand Total	1,747,073	41,455	1,788,523	2,073,513	241,365

Shipments of coke entirely from the Pocahontas field amounted to 99,256 tons.

BALTIMORE & OHIO

The following is a comparative statement of the coal and coke movement over this road for September and the first eight months of this year and last year:

	September		Nine Months	
	1913	1912	1913	1912
Coal	3,001,733	2,784,230	25,901,547	23,372,470
Coke	387,704	386,335	3,619,076	3,449,574
Total	3,389,437	3,170,565	29,520,623	26,822,044

VIRGINIAN RAILWAY

Total shipments of coal over this road for September of the current year were 393,199 tons as compared with 276,851 tons for the same month last year. For the nine months to Sept. 30 of the current year, the shipments were 3,291,941 tons as compared with 2,522,221 tons for the same period last year, showing a substantial increase.

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for September and first nine months of this year and last year in short tons:

	September		Nine Months	
	1913	1912	1913	1912
Anthracite	813,394	935,550	7,665,020	7,387,837
Bituminous	4,378,037	3,906,164	37,774,323	34,114,059
Coke	1,127,951	1,073,613	10,859,413	9,671,343
Total	6,319,382	55,915,3 7	26'298,756	51,173,239

IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports in the United States for August, 1912-13, and for the eight months ending August, 1911-12-13, in long tons:

	8 Months			August	
Imports from:	1911	1912	1913	1912	1913
United Kingdom..	5,881	5,881	3,693	1,143	229
Canada.....	686,984	916,453	746,029	150,472	67,418
Japan.....	9,271	18,616	70,229	400	6,564
Australia and Tasmania.....	142,684	84,554	96,651	3,969	9,017
Other countries...	139	1,925	2,816	1	6
Total.....	844,959	1,025,388	919,418	155,985	93,234
Exports:					
Anthracite.....2,294,005	2,186,330	2,847,443	540,438	398,530	
Bituminous,					
Canada.....6,428,135	6,696,010	8,652,472	1,328,189	1,532,227	
Panama.....	344,912	312,227	351,850	22,402	30,343
Mexico.....	378,740	224,561	377,098	13,775	26,137
Cuba.....	671,219	757,635	868,114	111,173	95,748
West Indies.....	364,704	480,410	419,496	32,641	42,032
Other countries...	455,149	1,197,509	1,165,481	82,995	100,012
Total.....8,642,859	9,668,352	11,834,511	1,591,175	1,826,499	
Bunker coal.....4,406,35	4,943,257	5,079,189	623,743	669,819	

COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during August and the first eight months of this year in comparison to last year, in short tons:

	August		Eight Months	
Anthracite	1912	1913	1912	1913
Baltimore & Ohio[1].....	125,357	94,702	950,993	933,805
Chesapeake & Ohio[1].....	808	1,642	18,076	11,988
Erie[2].....	739,121	769,423	4,717,796	5,739,611
Pennsylvania[1 3].....	927,277	713,451	6,452,287	6,851,626
Virginia[2 1].....	.....	.....	20	809
Total 5 roads.....	1,792,563	1,579,218	12,169,172	13,537,839
Bituminous				
Baltimore & Ohio[1].....	3,068,785	3,456,089	22,464,879	24,101,535
Buffalo, Roch. & P.[1 2]...	749,941	833,388	5,326,258	6,201,264
Buffalo & Susq.[1 2].....	138,974	155,375	956,133	1,206,526
Chesapeake & Ohio[1]....	1,552,892	1,665,525	11,870,710	11,036,996
Erie[2].....	7,783	9,872	184,335	293,740
Hunt. & Br'd T. Mt'[1 2]...	65,063	108,975	759,244	894,913
New York Central.....	667,262	763,112	5,080,151	5,953,578
Norfolk & Western[1 2]...	2,114,942	2,250,079	15,180,555	15,829,781
Pennsylvania[1 3].....	4,032,727	4,562,339	30,207,895	33,396,286
Pitts. & Lake Erie[1 2]....	1,155,951	1,154,219	7,312,284	8,585,935
Pitts. Shaw. & North[1 2]..	155,994	239,808	1,230,202	1,798,320
Virginia[1 2].....	337,366	376,083	2,334,731	2,898,724
Western Maryland.....	220,168	283,805	1,882,587	1,972,893
Total 13 roads.....	14,267,848	15,848,669	104,789,964	114,170,509
Coke				
Baltimore & Ohio[1].....	409,627	391,999	3,112,642	2,891,814
Buffalo, Roch. & P.[1 2]....	51,607	36,220	334,959	376,107
Buffalo & Susq.[1 2].....	27,004	20,006	173,715	200,032
Chesapeake & Ohio[1]....	22,082	26,723	167,969	237,206
New York Central.....	7,634	.....	57,992	36,207
Norfolk & Western[1 2]....	114,462	108,158	953,901	1,055,151
Pennsylvania[1 3].....	1,146,390	1,161,484	8,597,730	9,731,462
Pitts. & Lake Erie[1 2]....	551,943	537,557	4,082,161	4,656,960
Pitts. Shaw & North[1 2]..	.....	.....	5,155	9,383
Western Maryland.....	5,087	8,822	45,618	53,232
Total 10 roads.....	2,335,836	2,290,969	17,531,842	19,247,554
Coal and Coke, 13 Roads				
January.....			16,421,839	18,936,646
February.....			17,787,331	17,546,496
March.....			19,483,025	17,631,345
April.....			13,429,367	16,850,690
May.....			15,635,568	18,986,796
June.....			16,702,153	18,580,363
July.....			16,635,448	18,704,710
August.....			18,396,247	19,718,856
September.....			17,432,358	.....
October.....			18,712,657	.....
November.....			17,815,767	.....
December.....			17,929,632	.....
Total, 12 months.....			206,381,392	

[1] Includes coal from connecting lines.
[2] Includes company's coal.
[3] Does not include company's coal hauled free.

Note.—Southern Railway handled 338,648 short tons of coal during July and 2,409,598 short tons during the 7 months ending July.

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for July and the first seven months of the years 1912 and 1913:

State	July		Seven Months	
	1912	1913	1912	1913
Missouri.....	176,125	198,723	1,666,270	1,620,257
Kansas.....	337,367	465,761	2,794,914	3,134,125
Arkansas.....	126,224	163,185	1,033,059	1,026,101
Oklahoma.....	201,959	272,124	1,582,189	1,935,973
Totals.....	841,675	1,099,793	7,076,432	7,716,456

FOREIGN MARKETS

GREAT BRITAIN

Oct. 17—There is practically no change in the condition of the coal market. Admiralty list descriptions continue in good request for prompt shipment, but inferior classes of large are plentiful. Best small coals are steady. Forward business is slow, buyers generally adopting a waiting policy. Quotations are approximately as follows:

Best Welsh steam.....	$4.68@4.80	Best Monmouthshires..	$3.96@4.08
Best seconds.....	4.44@4.56	Seconds.....	3.72@3.90
Seconds.....	4.20@4.32	Best Cardiff smalls	2.46@2.52
Best dry coals.....	4.32@4.56	Seconds.....	2.28@2.40

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both net, exclusive of wharfage, and for cash in 30 days.

NOTES IN THE FOREIGN TRADE

The following excerpts are taken from the "Daily Consular and Trade Reports:"

Coal in the Klondike—The Northern Light, Power & Coal Co., of Dawson, shipped 10 tons of coal to Fairbanks, Alaska, in mid-August from its mines at Coal Creek, which is near the Alaska-Canadian line on the Canadian side. The Five Fingers Coal Co., whose mines are about midway between Dawson and Whitehorse, on the Yukon River, in Yukon Territory, is selling coal in Dawson at $14 per ton. Although a higher grade of coal than that of the other company, it contains a lower per cent. of pitch and forms more or less clinkers in burning.

The Elbe River Markets (Germany)—The lignite industry enjoyed a good business in 1912. Sales were greater than in 1910 and 1911, and were encouraged by the early winter, general activity in oil-consuming industries, and the normal sugar campaign. Labor conditions were satisfactory. Bohemian lignite importation was furthered by the good shipping facilities on the Elbe.

Guadeloupe (French West Indies)—Total coal imports into this country for 1912 amounted to 29,124 tons as compared with 39,459 tons in 1911; of this amount the United States furnished 25,881 tons in 1912, and 13,049 tons in 1911.

COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending Oct. 25.

	Week's Range			Year's Range	
Stocks	High	Low	Last	High	Low
American Coal Products.....	85	85	85	87	80
American Coal Products Pref.....	102	102	102	109½	105
Colorado Fuel & Iron.....	29⅜	27¼	28	41½	24½
Colorado Fuel & Iron Pref.....	....	....	155	155	150
Consolidation Coal of Maryland.....	....	....	102¼	102¼	102¼
Lehigh Valley Coal Sales.....	210	200	210	....	....
Island Creek Coal Com.....	47⅜	47	47	53½	47
Island Creek Coal Pref.....	84⅜	84	84	85	80
Pittsburgh Coal.....	21½	19⅞	20	24⅜	14½
Pittsburgh Coal Pref.....	91	88½	89	95	73
Pond Creek.....	20	18⅜	19	23¾	16½
Reading.....	163⅜	158⅞	162⅜	171	151⅜
Reading 1st Pref.....	83⅞	83	83	92½	82½
Reading 2nd Pref.....	..	..	91	95	84
Virginia Iron, Coal & Coke.....	42	40	42	54	37

	Closing		Week's Range		Year's
Bonds	Bid	Asked	or Last Sale		Range
Colo. F. & I. gen. s.f.g. 5s.....	95	98	98	Sept. '13	93½ 99½
Colo. F. & I. gen. 6s.....	104	106½	107½	June '12	.. ..
Col. Ind. 1st & coll. 5s. gu.....	80½	81	80½	80½	77½ 85
Cons. Ind. Coal Me. 1st 5s.....	..	..	76	Aug. '13	76 76
Cons. Coal 1st and ref. 5s.....	..	92½	93	Oct. '12	.. ..
Gr. Riv. Coal & C. 1st g 6s.....	..	..	102½	April '06	.. ..
K. & H. C. & C. 1st s f g 5s.....	91	..	98	Jan. '13	98 98
Pocah. Con. Coll. 1st s f 5s.....	..	86	85½	Oct. '13	85 87½
St. L. Rky. Mt. & Pac. 1st 5s.....	78	Sale	78	78	73 80½
Tenn. Coal gen. 5s.....	..	99	98½	99	98½ 103
Birm. Div. 1st consol. 6s.....	100½	101½	101½	Sept. '13	100½ 103
Tenn. Div. 1st g 6s.....	100½	Sale	100½	100½	99 102
Cah. C. M. Co. 1st g 6s.....	..	..	103	July '13	103 103
Utah Fuel 1st g 5s.....	..	..	..	..	.. ..
Victor Fuel 1st s f 5s.....	..	80	80	May '13	79½ 80
Va. I. Coal & Coke 1st g 5s.....	92½	93	93	93	92 98

DIVIDENDS

New Central Coal Co.—Dividend of 2%, payable Nov. 1 to holders of record, Oct. 29.

Geo. B. Newton Coal Co.—Dividend of 3½% on the first preferred, payable Nov. 1 to holders of record, Oct. 25.

INDEX OF COAL LITERATURE

We will furnish copy of any article (if in print)) for the price quoted. Where no price is quoted, the cost is unknown. Inasmuch as the papers must be ordered from the publishers, there will be some delay for foreign papers. Remittance must be sent with order.

ACCIDENTS AND THEIR PREVENTION

A Suggested Method of Preventing Rock Slides. Geo. S. Rice. Jl. West. Soc. Engrs., September, 1913; 17 pp., illus.

Method of Preventing Rock Slides—Discussion of Mr. Rice's paper. Jl. West. Soc. Engrs., September, 1913; 22 pp.

Preventing Accidents from Machinery. Frank H. Kneeland. Coal Age, Oct. 4, 1913; 3½ pp., illus. 10c.

BLASTING EXPLOSIVES

Shotfiring and Watering Systems in Utah Mines. John E. Ambrose. Coal Age, Oct. 11, 1913; 2 pp., illus. 10c.

BORING AND TUNNELING

A New Gasoline Rock Drill. Coal Age, Oct. 11, 1913; ½ p., illus. 10c.

Ten Deep Borings in East Kent, England. Malcolm Burr. Coll. Guard., Oct. 10, 1913; 3¼ pp., illus. 40c.

COAL DUST

A Laboratory Study of the Inflammability of Coal Dust. J. C. W. Frazer, E. J. Hoffman and L. A. Scholl, Jr. Bureau of Mines, Bull. 50; 55 pp., illus.

Danger of Coal Dust and Its Preventive. Iron Coal Tr. Rev., Oct. 10, 1913; ¾ p. 40c.

How Best to Handle the Dry or Dusty Mine. David Victor. Black Diamond, Sept. 27, 1913; 1 p. 20c.

The Influence of the Presence of Gas Upon the Inflammability of Coal Dust in Air. (Proc. A. M. E. E., Vol. 3). Prof. W. M. Thornton. Coll. Guard., Sept. 19, 1913; 1½ pp, illus. 40c.

COKE

Apparatus for the Testing of Firebricks for Use in Coke Ovens. Iron Coal Tr. Rev., Sept. 26, 1913; ½ p., illus. 40c.

Continuous Vertical Retort Carbonization. (Describes a system in use at Hebden Bridge, England.) Gas Wld., Oct. 4, 1913; 1½ pp., illus. 40c.

Extension to the Coke-Oven and Byproduct Plant at Devonshire Works. Iron Coal Tr. Rev., Oct. 10, 1913; 1⅛ pp., illus. 40c.

The Manufacture of Coke in Belgium. (Paper by Baron Evance Coppee read before the Iron and Steel Inst., Sept., 1913.) Iron Coal Tr. Rev., Sept. 5, 1913; 5½ pp., illus. 40c.

DRAINAGE, PUMPING, ETC.

A New Acid-Proof Mine Pump. Coal Age, Oct. 18, 1913; ½ p., illus. 10c.

Large Colliery Pump. Iron Coal Tr. Rev., Sept. 26, 1913; ½ p., illus. 40c.

ELECTRICITY

A Big Electrically Driven Air Compressor. Coal Age, Oct. 4, 1913; 1 p., illus. 10c.

Care of Induction Motors at Mines and Mills. Geo. E. Edwards. Min. Wld., Oct. 18, 1913; 3½ pp., illus. 20c.

Electrically Propelled Inclined Railway for Unloading Coal. Elec. Wld., Sept. 20, 1913; 1 p., illus. 20c.

EXPLOSIONS

Experimental Explosion at Bruceton Mine. Coal Age, Oct. 11, 1913; 1½ pp., illus. 10c.

Inquiry into the Cadder Pit Disaster. Coll. Guard., Sept. 12, 1913; 1½ pp. 40c.

Mill for the Production of Stone Dust. Iron Coal Tr. Rev., Sept. 12, 1913; ¼ p., illus. 40c.

Spontaneous Ignition of Coal. T. A. Peebles. Power, Sept. 30, 1913; ¾ p. 15c.

FUEL TESTING

Analyses of Coals in the United States. N. W. Lord, with chapters by J. A. Holmes, F. M. Stanton, A. C. Fieldner and S. Sanford. Bureau of Mines, Bull. 22, Part I; 316 pp., illus.

Analyses of Coals in the United States. N. W. Lord, with chapters by J. A. Holmes, F. M. Stanton, A. C. Fieldner and S. Sanford. Bureau of Mines, Bull. 22, Part II; 834 pp.

A Study of the Oxidation of Coal and of the Process of Combustion. (Address by H. C. Porter delivered at annual meeting of the Amer. Chem. Soc.) Metall. & Chem. Engr., October, 1913; ½ p. 35c.

Further Researches in the Microscopical Examination of Coal, Especially in Relation to Spontaneous Combustion. (Paper by James Lomax read before the I. M. E., Manchester, September, 1913.) Coll. Guard., Sept. 26, 1913; 1¼ pp. 40c.

The Production of Motor Spirit from Coal. A. Rollason and A. W. Taylor. Coll. Guard., Sept. 19, 1913; 1 p. 40c.

The Absorption of Oxygen by Coal. (Paper by T. F. Winmill read before the I. M. E. Manchester, September, 1913.) Coll. Guard., Sept. 26, 1913; 2⅛ pp., illus. 40c.

GENERAL

Burning Anthracite Culm. J. E. Parrish. Coal Age, Oct. 11, 1913; 3¾ pp., illus. 10c.

Conservation of Coal and Liquid Fuel. (A resumé of the papers read at the 83d annual meeting of the British Assn. for the Advancement of Science, held at Birmingham, Eng., Sept. 10-17, 1913.) Power, Oct. 21, 1913; 2 pp. 15c.

Mining Coal Inside the Arctic Circle. Black Diamond, Sept. 27, 1913; ½ p., illus. 20c.

Powdered Coal in Open-Hearth Steel Furnaces. Coal & Coke Op., Sept. 25, 1913; ¾ p. 20c.

Problems of the Anthracite Operator are Measured. (Address by A. M. Fine before the New York and Western Penn. Coal Merchants Assn.) Black Diamond, Sept. 13, 1913; 1½ pp., illus. 20c.

The Geographical Value of Coal. (Address by Prof. H. N. Dickson at the British Association.) Coll. Guard., Oct. 3, 1913; ⅛ p. 40c.

The Production and Use of Brown Coal in the Vicinity of Cologne, Germany. Chas. A. Davis. Bureau of Mines, Tech. Paper 55; 8½ pp.

The Coal Miner's Wage Conditions. W. L. Hammill. Coal Tr. Bull., Oct. 1, 1913; 2¾ pp. 25c.

The Coal-Mining Adjuncts of Railroads. John D. A. Morrow. Ry. Age Gaz., Oct. 10, 1913; ¾ p. 25c.

The Disposition of Natural Resources. Geo. Otis Smith. Bull. A. I. M. E., October, 1913; 6 pp.

The Use of Coal as a Fuel for Metallurgical Furnaces. H. R. Barnhurst. Bull. A. I. M. E., October, 1913; 9½ pp.

GEOLOGY

Crowsnest Pass Coal Fields. (Extracts from Guide Book No. 9 by Geol. Sur. of Canada.) W. W. Leach.. Can. Min. Jour., Oct. 1, 1913; 3 pp., illus. 25c.

Sydney Coal Field. (Extracts from Guide Book No. 1 published by the Geol. Sur.) G. A. Young. Can. Min. Jour., Oct. 15, 1913; 1¼ pp. 25c.

The Coal Fields of Montana. E. Stebinger. Bull. Inst M. E., September, 1913; 30 pp., illus.

The Coal Deposits at Nanaimo, Vancouver Island, B. C. (Extracts from Guide Book of Geol. Sur. of Can.) Chas. H. Clapp. Can. Min. Jour., Sept. 15, 1913; 1¼ pp. 25c.

The Development of the Midland Coal Fields. (Paper read by Fred. G. Meachem before the British Assn.) Coll. Guard., Sept. 19, 1913; 1 p. 40c.

HOISTING AND HAULAGE

Animal Haulage in Mines. B. S. Randolph. Coll. Engr., October, 1913; 3¼ pp., illus. 40c.

A New Coal-Hoisting System. Coal Age, Sept. 6, 1913; ¾ p., illus. 10c.

Compressed-Air Mine Haulage. Wm. Z. Price. Coll. Engr., October, 1913; 2¾ pp., illus. 40c.

Efficiency of Rope Driving as a Means of Power Transmission. E. H. Ahara. Jl. Amer. Soc. Mech. Engrs., August, 1913; 19 pp., illus.

Efficiency in Mine Haulage. W. H. Bines. Coll. Engr., October, 1913; 1½ pp., illus. 40c.

Gasoline Mine Locomotives. Carl Scholz. Coll. Engr., October, 1913; 1½ pp. 40c.

Notes on Rail Bonding. Vincent Rhea. Coal Age, Sept. 27, 1913; 1½ pp., illus. 10c.

Observations on Use and Care of Mine Rope. Arthur Prill. Coal & Coke Op., Sept. 11, 1913; 1¾ pp. 20c.

Practical Mule Haulage. A. E. Thompson. Coll. Engr., October, 1913; 1¾ pp. 40c.

Rope Haulage at Vesta No. 4 Mine. (Probably the greatest system of mechanical haulage in the coal-mining world.) Wm. Z. Price. Coll. Engr., October, 1913; 4 pp., illus. 40c.

The Protection of Pit Ponies. Coll. Engr., October, 1913; ½ p., illus. 40c.

The Storage Battery Locomotive. A. R. Anderson. Coll. Engr., October, 1913; 5 pp., illus. 40c.

The Prevention of Overwinding. Coll. Engr., October, 1913; ½ p., illus. 40c.

LEGAL REFERENCES

A Dissertation on U. S. Mining Law. Russell L. Dunn. Mg. & Eng. Wld., Sept. 20, 1913; 5½ pp. 20c.

Leasing of Mineral Lands. Wm. Griffith. Coal Tr. Bull., Oct. 1, 1913; 1½ pp. 25c.

Mine Owners and Proposed Legislation. G. D. Crain, Jr. Coal & Coke Op., Sept. 18, 1913; 1½ pp. 20c.

New Laws and Transportation in Alaska. Eng. & Mg. Jl., Oct. 4, 1913; 1 p., illus. 25c.

Removal of Coal through Adjoining Land. A. L. H. Street. Coal Age, Oct. 4, 1913; 1½ pp. 10c.

Revision of United States Mining Laws. (Report of Committee of Min. & Metall. Soc. of America.) H. V. Winchell, C. W. Goodale and M. L. Requa. Min. & Sci. Press, Oct. 11, 1913; 3¾ pp. 20c.

Tax on Mining Income. Eng. & Mg. Jl., Oct. 4, 1913; 1½ pp. 25c.

Validity of Coal Trade Names. A. L. H. Street. Coal Age, Sept. 6, 1913; 1 p. 10c.

When Is Delivery to the Carrier a Delivery to the Buyer? A. L. H. Street. Coal Age, Sept. 20, 1913; 1 p. 10c.

LIGHTING

Safety Lamps Approved by the Home Secretary of England. Iron Coal Tr. Rev., Sept. 12, 19, 26, Oct. 3 and 10, 1913; 9¼ pp., illus. $1.

The Lighting of Mines. Wm. Seddon. Coal & Coke Op., Oct. 16, 1913; 1¾ pp. 20c.

MINE FIRES

Averting a Mine Fire in Germany. Coal Age, Sept. 20, 1913; ½ p., illus. 10c.

Fire Fighting by the Madison Corporation. A. T. Shurick. Coal Age, Oct. 25, 1913; 4 pp., illus. 10c.

MINING COSTS

Cost of Mining as Related to Output. R. C. Jones. Coll. Engr., October, 1913; 3¾ pp., illus. 40c.

Does Bituminous Mining Pay? (Gives some interesting facts and figures concerning the coal production of this country in the past, and shows the steadily increasing amount mined per capita of population and rising cost per ton.) A. E. Rickards. Coal Age, Sept. 20, 1913; 5 pp., illus. 10c.

Economy in the Mine Machine Shop. W. J. Crocker. Mg. & Eng. Wld., Oct. 4, 1913; 1½ pp. 20c.

Influence of Labor Situation on Coal Values. Black Diamond, Sept. 27, 1913; 1¼ pp. 20c.

MINE GASES, TESTING

A Method of Measuring Goaf Temperatures. (Paper by T. F. Winmill read before the I. M. E., Manchester, September, 1913.) Coll. Guard., Sept. 26, 1913; ½ p., illus. 40c.

Mice and Birds for Gas Testing in Mines. Coal & Coke Op., Sept. 25, 1913; ¾ p. 20c.

The Influence of Inert Cases on Inflammable Gaseous Mixtures. J. K. Clement. Bureau of Mines, Tech. Paper 43; 15 pp., illus.

PREPARATION

The Prepartion of Anthracite. (Paper read before the New York State and Western Pennsylvania Coal Merchants Assn.) Coal Tr. Jl., Sept. 24, 1913; ½ p. 35c.

RESCUE, SAFETY APPARATUS

A New Resuscitation Apparatus. Coal Age, Oct. 4, 1913; ¾ p., illus. 10c.

First-Aid Instructions for Miners. M. W. Glasgow, W. A. Raudenbush and C. O. Roberts. Bureau of Mines. Miners Circular 8; 55 pp., illus.

Mine Rescue Work in Great Britain. Coal Age, Oct. 4, 1913; 1 p., illus. 10c.

New Rescue Stations in Yorkshire. (England) Coll. Guard., Sept. 5, 1913; 1 p., illus. 40c.

Rules for Mine-Rescue and First-Aid Field Contests. James W. Paul. Bureau of Mines, Miners' Circular 15; 7 pp.

SANITATION, DISEASES

Miners' Nystagmus. (Paper read by Dr. J. Court before the Midland I. M. C. M. E., Sept. 27.) Iron Coal Tr. Rev., Oct. 3, 1913; 1¼ pp. 40c.

Sanitation at Mining Villages in the Birmingham District, Ala. Bureau of Mines, Tech. Paper 33; 21 pp., illus.

SHAFTS, SHAFT SINKING

The Sinking and Equipping of Bedwas Colliery. (Paper by Edmund L. Hann read before the So. Wales Inst. of Engrs.) Coll. Guard., Sept. 5, 1913; 5½ pp., illus. 40c.

STEAM ENGINES AND BOILERS

Coal and Ash Handling in a Large Industrial Power Plant. Indus. Eng., October, 1913; 2 pp., illus. 30c.

Coal Products Company's Power Plant. S. G. Artingstall, Jr. Power, Sept. 16, 1913; 3¼ pp., illus. 15c.

The Buckeye Locomobile. (Describes machine which utilizes the best principles of efficiency for reciprocating engines known to exist.) Coal Age, Sept. 13; 2¼ pp., illus. 10c.

STORAGE

A 30,000-Ton Submerged Coal-Storage Pit. Eng. News, Sept. 11, 1913; 1 p., illus. 25c.

SIGNALING

Evolution of an Electric Signal System. Geo. A. Packard. Eng. & Min. Jour., Oct. 18, 1913; 1¼ pp., illus. 25c.

Wireless Telephony at Dinnington Main Colliery. Iron Coal Tr. Rev., Sept. 19, 1913; ⅓ p. 40c.

TRANSPORTATION

Aërial Ropeway at English Colliery. Coal Age, Oct. 25, 1913; 1 p., illus. 10c.

Availability of Motor Trucks for Mines. Eng. & Min. Jour., Oct. 18, 1913; 3¾ pp. 25c.

A Modern Distribution and Storing Plant. Alfred Gradenwitz. Coal Age, Sept. 13, 1913; 3 pp., illus. 10c.

Coal Shipping on the Great Lakes. Coal Age, Sept. 6, 13, 20, 27 and Oct. 11, 1913; 16 pp., illus. 50c.

Coal-Face Conveyors at Leasingthorne Colliery, Durham. Iron Coal Tr. Rev., Sept. 5, 1913; 2¼ pp., illus. 40c.

Improved Coal Shipping Facilities on the Tyne. Coll. Guard., Oct. 10, 1913; 1½ pp., illus. 40c.

New Coal-Shipping Appliances on the River Tyne. Iron Coal Tr. Rev., Sept. 26, 1913; ½ p., illus. 40c.

VENTILATION

A New Type of Colliery Fan. Coal Age, Oct. 18, 1913; ¾ p., illus. 10c.

The Regulator. J. W. Scott. Min. Eng., October, 1913; pp., illus. 40c.

WORKING OF MINERALS

Coal Stripping in Kansas. W. S. Russell. Excavt. Engr., October, 1913; 3 pp., illus.

Mining Low Seams of Anthracite. Hugh Archbald. Coal Age, Oct. 25, 1913; 3¼ pp., illus. 10c.

Machine Mining in the South Wales Steam Coals. (Paper by G. D. Budge, and W. E. Jayne read before the So. Wales Inst. Engrs.) Coll. Guard., Sept. 26, 1913; 1⅞ pp., illus.

Submarine Coal Mining. John E. Spicer. Coal Age, Sept. 27, 1913; 1¼ pp., illus. 10c.

Working Thick Highly Inclined Seams. John E. Ambrose. Coal Age, Sept. 27, 1913; 1¼ pp., illus. 10c.

Strip-Pit Mining in Kansas. Barry E. Scobee. Coal Age, Oct. 25, 1913; 2¾ pp., illus. 10.